UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K

☑ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2021

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from ______ to ______

Commission file number 001-14905

BERKSHIRE HATHAWAY INC.

(Exact name of Registrant as specified in its charter)

Delaware	47-0813844
State or other jurisdiction of incorporation or organization	(I.R.S. Employer Identification No.)
3555 Farnam Street, Omaha, Nebraska	68131
(Address of principal executive office)	(Zip Code)

Registrant's telephone number, including area code (402) 346-1400

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbols	Name of each exchange on which registered
Class A Common Stock	BRK.A	New York Stock Exchange
Class B Common Stock	BRK.B	New York Stock Exchange
0.750% Senior Notes due 2023	BRK23	New York Stock Exchange
1.125% Senior Notes due 2027	BRK27	New York Stock Exchange
1.625% Senior Notes due 2035	BRK35	New York Stock Exchange
1.300% Senior Notes due 2024	BRK24	New York Stock Exchange
2.150% Senior Notes due 2028	BRK28	New York Stock Exchange
0.625% Senior Notes due 2023	BRK23A	New York Stock Exchange
0.000% Senior Notes due 2025	BRK25	New York Stock Exchange
2.375% Senior Notes due 2039	BRK39	New York Stock Exchange
0.500% Senior Notes due 2041	BRK41	New York Stock Exchange
2.625% Senior Notes due 2059	BRK59	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: NONE

Indicate by check mark if the Registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☑ No ☐

Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☑

Indicate by check mark whether the Registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☑ No ☐

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act. Large accelerated filer ☑ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐

If an emerging growth company, indicate by check mark if the Registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☑

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☑

State the aggregate market value of the voting stock held by non-affiliates of the Registrant as of June 30, 2021: $503,600,000,000*

Indicate the number of shares outstanding of each of the Registrant's classes of common stock:

February 14, 2022—Class A common stock, $5 par value	615,333 shares

February 14, 2022—Class B common stock, $0.0033 par value	1,291,212,661 shares

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Proxy Statement for the Registrant's Annual Meeting to be held April 30, 2022 are incorporated in Part III.

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* This aggregate value is computed at the last sale price of the common stock as reported on the New York Stock Exchange on June 30, 2021. It does not include the value of Class A common stock and Class B common stock held by Directors and Executive Officers of the Registrant and members of their immediate families, some of whom may not constitute "affiliates" for purpose of the Securities Exchange Act of 1934.

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Part I

Item 1. Business Description

Berkshire Hathaway Inc. ("Berkshire," "Company" or "Registrant") is a holding company owning subsidiaries engaged in numerous diverse business activities. The most important of these are insurance businesses conducted on both a primary basis and a reinsurance basis, a freight rail transportation business and a group of utility and energy generation and distribution businesses. Berkshire also owns and operates numerous other businesses engaged in a variety of manufacturing, services, retailing and other activities. Berkshire is domiciled in the state of Delaware, and its corporate headquarters is in Omaha, Nebraska.

Berkshire's operating businesses are managed on an unusually decentralized basis. There are few centralized or integrated business functions. Berkshire's corporate senior management team participates in and is ultimately responsible for significant capital allocation decisions, investment activities and the selection of the Chief Executive to head each of the operating businesses.

Berkshire's senior management is also responsible for establishing and monitoring Berkshire's corporate governance practices, including monitoring governance efforts, including those at the operating businesses, and participating in the resolution of governance-related issues as needed. Berkshire's Board of Directors is responsible for assuring an appropriate successor to the Chief Executive Officer. The Berkshire Code of Business Conduct and Ethics emphasizes, among other things, the commitment to ethics and compliance with the law and provides basic standards for ethical and legal behavior of its employees.

Human capital and resources are an integral and essential component of Berkshire's businesses. Berkshire and its consolidated subsidiaries employed approximately 372,000 people worldwide at the end of 2021, of which approximately 77% were in the United States and 21% were represented by unions. Employees engage in a wide variety of occupations. Consistent with Berkshire's decentralized management philosophy, Berkshire's operating businesses individually establish specific policies and practices concerning the attraction and retention of personnel within the organizations. Given the wide variations in the nature and size of business activities, policies and practices often vary widely among Berkshire's operating subsidiaries. Policies and practices commonly address, among other things: maintaining a safe work environment and minimizing or eliminating workplace injuries; offering competitive compensation to employees, which includes various health insurance and retirement benefits, as well as other benefits such as incentives to recognize and reward performance; wellness programs; training, learning and career advancement opportunities; and hiring practices intended to identify qualified candidates and promote diversity and inclusion in the workforce.

Insurance and Reinsurance Businesses

Berkshire's insurance and reinsurance business activities are conducted through numerous domestic and foreign-based insurance subsidiaries. Berkshire's insurance subsidiaries provide insurance and reinsurance of property and casualty risks and reinsurance of life and health risks worldwide. Berkshire's insurance subsidiaries employed approximately 50,500 people at the end of 2021. For purposes of this discussion, entities that provide insurance or reinsurance are referred to as insurers.

In direct or primary insurance activities, the insurer assumes the risk of loss from persons or organizations that are directly subject to the risks. Such risks may relate to property, casualty (or liability), life, accident, health, financial or other perils that may arise from an insurable event. In reinsurance activities, the insurer assumes defined portions of risks that other direct insurers or reinsurers assumed in their own insuring activities.

Reinsurance contracts are normally classified as treaty or facultative contracts. Treaty reinsurance refers to reinsurance coverage for all or a portion of a specified group or class of risks ceded by a direct insurer or reinsurer, while facultative reinsurance involves coverage of specific individual underlying risks. Reinsurance contracts are further classified as quota-share or excess. Under quota-share (proportional or pro-rata) reinsurance, the reinsurer shares proportionally in the original premiums and losses of the direct insurer or reinsurer. Excess (or non-proportional) reinsurance provides for the indemnification of the direct insurer or reinsurer for all or a portion of the loss in excess of an agreed upon amount or "retention." Both quota-share and excess reinsurance contracts may provide for aggregate limits of indemnification.

Insurance and reinsurance are generally subject to regulatory oversight throughout the world. Except for regulatory considerations, there are virtually no barriers to entry into the insurance and reinsurance industry. Competitors may be domestic or foreign, as well as licensed or unlicensed. The number of competitors within the industry is not known. Insurers compete on the basis of reliability, financial strength and stability, financial ratings, underwriting consistency, service, business ethics, price, performance, capacity, policy terms and coverage conditions.

Insurers based in the United States ("U.S.") are subject to regulation by their states of domicile and by those states in which they are licensed to write policies on an admitted basis. The primary focus of regulation is to assure that insurers are financially solvent and that policyholder interests are otherwise protected. States establish minimum capital levels for insurance companies and establish guidelines for permissible business and investment activities. States have the authority to suspend or revoke a company's authority to do business as conditions warrant. States regulate the payment of dividends by insurance companies to their shareholders and other transactions with affiliates. Dividends, capital distributions and other transactions of extraordinary amounts are subject to prior regulatory approval.

Insurers may market, sell and service insurance policies in the states where they are licensed. These insurers are referred to as admitted insurers. Admitted insurers are generally required to obtain regulatory approval of their policy forms and premium rates. Non-admitted insurance markets have developed to provide insurance that is otherwise unavailable through admitted insurers. Non-admitted insurance, often referred to as "excess and surplus" lines, is procured by either state-licensed surplus lines brokers who place risks with insurers not licensed in that state or by the insured party's direct procurement from non-admitted insurers. Non-admitted insurance is subject to considerably less regulation with respect to policy rates and forms. Reinsurers are normally not required to obtain regulatory approval of premium rates or reinsurance contracts.

The insurance regulators of every state participate in the National Association of Insurance Commissioners ("NAIC"). The NAIC adopts forms, instructions and accounting procedures for use by U.S. insurers in preparing and filing annual statutory financial statements. However, an insurer's state of domicile has ultimate authority over these matters. In addition to its activities relating to the annual statement, the NAIC develops or adopts statutory accounting principles, model laws, regulations and programs for use by its members. Such matters deal with regulatory oversight of solvency, risk management, compliance with financial regulation standards and risk-based capital reporting requirements.

U.S. states, through the NAIC, and international insurance regulators through the International Association of Insurance Supervisors ("IAIS") have been developing standards and best practices focused on establishing a common set of principles ("Insurance Core Principles") and framework ("ComFrame") for the regulation of large multi-national insurance groups. The IAIS is developing capital standards for internationally active insurance groups (the "Insurance Capital Standard") based on a consolidated group approach and is also evaluating a potentially comparable group capital standard based on the aggregation of regulated entities and their underlying local capital requirements (the "Aggregation Method"). The IAIS standards address a variety of topics regarding supervision, coordination of regulators, insurance capital standards, risk management and governance. While the IAIS standards do not have legal effect, the states and the NAIC are implementing various group supervision regulatory tools and mandates that are responsive to certain IAIS standards. U.S. state regulators have formed supervisory colleges intended to promote communication and cooperation amongst the various domestic and international insurance regulators. The Nebraska Department of Insurance acts as the lead supervisor for our group of insurance companies and chairs the Berkshire supervisory college. U.S. state regulators now require insurance groups to file an annual report, the Own Risk Solvency Assessment or ORSA, with the group's lead supervisor. The NAIC recently adopted a group capital calculation based on methodology similar to the Aggregation Method, which leverages the NAIC's existing Risk Based Capital standards. The NAIC's group capital calculation is a tool designed to help the lead supervisor understand the capital adequacy across an insurance group. The NAIC is also developing further tools, including various liquidity assessments, that will likely be imposed on insurance groups in the near future.

Berkshire's insurance companies maintain capital strength at exceptionally high levels, which differentiates them from their competitors. Collectively, the combined statutory surplus of Berkshire's U.S.-based insurers was approximately $301 billion at December 31, 2021. Berkshire's major insurance subsidiaries are rated AA+ by Standard & Poor's and A++ (superior) by A.M. Best with respect to their financial condition and claims paying ability.

The Terrorism Risk Insurance Act of 2002 established within the Department of the Treasury a Terrorism Insurance Program ("Program") for commercial property and casualty insurers by providing federal reinsurance of insured terrorism losses. The Program currently extends to December 31, 2027 through other Acts, most recently the Terrorism Risk Insurance Program Reauthorization Act of 2019. Hereinafter these Acts are collectively referred to as TRIA. Under TRIA, the Department of the Treasury is charged with certifying "acts of terrorism." Coverage under TRIA occurs if the industry insured loss for certified events occurring during the calendar year exceeds $200 million in any calendar year.

To be eligible for federal reinsurance, insurers must make available insurance coverage for acts of terrorism, by providing policyholders with clear and conspicuous notice of the amount of premium that will be charged for this coverage and of the federal share of any insured losses resulting from any act of terrorism. Assumed reinsurance is specifically excluded from TRIA participation. TRIA currently also excludes certain forms of direct insurance (such as personal and commercial auto, burglary, theft, surety and certain professional liability lines). Reinsurers are not required to offer terrorism coverage and are not eligible for federal reinsurance of terrorism losses.

In the event of a certified act of terrorism, the federal government will reimburse insurers (conditioned on their satisfaction of policyholder notification requirements) for 80% of their insured losses in excess of an insurance group's deductible. Under the Program, the deductible is 20% of the aggregate direct subject earned premium for relevant commercial lines of business in the immediately preceding calendar year. The aggregate deductible in 2022 for Berkshire's insurance group is expected to approximate $1.6 billion. There is also an aggregate program limit of $100 billion on the amount of the federal government coverage for each TRIA year.

The extent of insurance regulation varies significantly among the countries in which our non-U.S. operations conduct business. While each country imposes licensing, solvency, auditing and financial reporting requirements, the type and extent of the requirements differ substantially. For example:

- in some countries, insurers are required to prepare and file monthly and/or quarterly financial reports, and in others, only annual reports;
- some regulators require intermediaries to be involved in the sale of insurance products, whereas other regulators permit direct sales contact between the insurer and the customer;
- the extent of restrictions imposed upon an insurer's use of local and offshore reinsurance vary;
- policy form filing and rate regulation vary by country;
- the frequency of contact and periodic on-site examinations by insurance authorities differ by country;
- the scope and prescriptive requirements of an insurer's risk management and governance framework vary significantly by country; and
- regulatory requirements relating to insurer dividend policies vary by country.

Significant variations can also be found in the size, structure and resources of the local regulatory departments that oversee insurance activities. Certain regulators prefer close relationships with all subject insurers and others operate a risk-based approach.

Berkshire's insurance group operates in some countries through subsidiaries and in some countries through branches of subsidiaries. Berkshire insurance subsidiaries are located in several countries, including Germany, the United Kingdom ("U.K."), Ireland, Australia and South Africa, and also maintain branches in several other countries. Most of these foreign jurisdictions impose local capital requirements. Other legal requirements include discretionary licensing procedures, local retention of funds and records, and data privacy and protection program requirements. Berkshire's international insurance companies are also subject to multinational application of certain U.S. laws.

There are various regulatory bodies and initiatives that impact Berkshire in multiple international jurisdictions and the potential for significant effect on the Berkshire insurance group could be heightened as a result of recent industry and economic developments.

In 2016, the U.K. voted in a national referendum to withdraw from the European Union ("EU") ("Brexit"), which resulted in the U.K.'s withdrawal from the EU on January 31, 2020. In anticipation of the U.K. leaving the EU, Berkshire Hathaway European Insurance DAC in Ireland was established to permit property and casualty insurance and reinsurance businesses to continue to operate in the EU, and Berkshire continues to maintain a substantial presence in London following Brexit.

Berkshire's insurance underwriting operations include the following groups: (1) GEICO, (2) Berkshire Hathaway Primary Group and (3) Berkshire Hathaway Reinsurance Group. Except for retroactive reinsurance and periodic payment annuity products that generate significant amounts of up-front premiums along with estimated claims expected to be paid over long time periods (creating "float," see Investments section), Berkshire expects to achieve an underwriting profit over time and to reject inadequately priced risks. Underwriting profit is defined as earned premiums less associated incurred losses, loss adjustment expenses and underwriting and policy acquisition expenses. Underwriting profit does not include income earned from investments. Additional information related to each of Berkshire's underwriting groups follows.

GEICO—GEICO is headquartered in Chevy Chase, Maryland. GEICO's insurance subsidiaries consist of Government Employees Insurance Company, GEICO General Insurance Company, GEICO Indemnity Company, GEICO Casualty Company, GEICO Advantage Insurance Company, GEICO Choice Insurance Company, GEICO Secure Insurance Company, GEICO County Mutual Insurance Company, GEICO Texas County Mutual Insurance Company and GEICO Marine Insurance Company. The GEICO companies primarily offer private passenger automobile insurance to individuals in all 50 states and the District of Columbia. GEICO also provides insurance for motorcycles, all-terrain vehicles, recreational vehicles, boats and small commercial fleets and acts as an agent for other insurers who offer homeowners, renters, life and identity management insurance to individuals who desire insurance coverages other than those offered by GEICO.

GEICO’s marketing is primarily through direct response methods in which applications for insurance are submitted directly to the companies via the Internet or by telephone, and to a lesser extent, through captive agents. GEICO conducts business through regional service centers and claims adjustment and other facilities in 39 states.

The automobile insurance business is highly competitive in the areas of price and service. GEICO competes for private passenger automobile insurance customers in the preferred, standard and non-standard risk markets with other companies that sell directly to the customer and with companies that use agency sales forces, including State Farm, Allstate, Progressive and USAA. GEICO’s advertising campaigns and competitive rates contributed to a cumulative increase in voluntary policies-in-force of approximately 26.0% over the past five years. According to the most recently published A.M. Best data for 2020, the five largest automobile insurers had a combined market share in 2020 of approximately 59.7% based on written premiums, with GEICO’s market share being the second largest at approximately 13.5%. GEICO’s written premiums in 2020 were reduced by the effects of the GEICO Giveback Program implemented in response to significant reductions in claim frequencies attributable to reduced policyholder driving during the initial stages of the COVID-19 pandemic. Pandemic-related premium credit programs of other private passenger insurers may not have been reported as premium reductions, which impacts the industry data reported by A.M Best. Since the publication of that data, GEICO’s management estimates its current market share is approximately 14.2%. Seasonal variations in GEICO’s insurance business are not significant. However, extraordinary weather conditions or other factors may have a significant effect upon the frequency or severity of automobile claims.

State insurance departments stringently regulate private passenger auto insurance. As a result, it is difficult for insurance companies to differentiate their products. Competition for private passenger automobile insurance, which is substantial, tends to focus on price and level of customer service provided. GEICO’s cost-efficient direct response marketing methods and emphasis on customer satisfaction enable it to offer competitive rates and value to its customers. GEICO primarily uses its own claims staff to manage and settle claims. The name and reputation of GEICO are material assets and management protects those and other service marks through appropriate registrations.

Berkshire Hathaway Primary Group—The Berkshire Hathaway Primary Group (“BH Primary”) is a collection of independently managed insurers that provide a wide variety of insurance coverages to policyholders located principally in the United States. These various operations are discussed below.

National Indemnity Company (“NICO”), domiciled in Nebraska, and certain affiliates (“NICO Primary”) underwrite commercial motor vehicle and general liability insurance on an admitted basis and on an excess and surplus basis. Insurance coverages are offered nationwide primarily through insurance agents and brokers.

The Berkshire Hathaway Homestate Companies (“BHHC”) is a group of insurers offering workers’ compensation, commercial auto and commercial property coverages to a diverse client base. BHHC has a national reach, with the ability to provide first-dollar and small to large deductible workers’ compensation coverage to employers in all states, except those where coverage is available only through state-operated workers’ compensation funds. NICO Primary and BHHC are each based in Omaha, Nebraska.

Berkshire Hathaway Specialty Insurance (“BH Specialty”) offers commercial property, casualty, healthcare professional liability, executive and professional, surety, travel, medical stop loss and homeowner’s insurance through Berkshire Hathaway Specialty Insurance Company and other Berkshire insurance affiliates. BH Specialty writes primary and excess policies on an admitted and surplus basis in the U.S., and on a local or foreign non-admitted basis outside the U.S. BH Specialty is based in Boston, Massachusetts, with regional offices currently in several U.S. cities. BH Specialty also maintains international offices located in Australia, New Zealand, Canada and several countries in Asia, Europe and the Middle East. BH Specialty writes business through wholesale and retail insurance brokers, as well as managing general agents.

MedPro Group (“MedPro”) is a leading provider of healthcare liability (“HCL”) insurance in the United States. MedPro provides customized HCL insurance, claims, patient safety and risk solutions to physicians, surgeons, dentists and other healthcare professionals, as well as hospitals, senior care and other healthcare facilities. Additionally, MedPro provides HCL insurance solutions to international markets through other Berkshire insurance affiliates, delivers liability insurance to other professionals, and offers specialized accident and health insurance solutions to colleges and other customers through its subsidiaries and other Berkshire insurance affiliates. MedPro is based in Fort Wayne, Indiana.

U.S. Liability Insurance Company (“USLI”) includes a group of five specialty insurers that underwrite commercial, professional and personal lines insurance on an admitted basis, as well as on an excess and surplus basis. USLI markets policies in all 50 states, the District of Columbia and Canada through wholesale and retail insurance agents. USLI companies also underwrite and market a wide variety of specialty insurance products. USLI is based in Wayne, Pennsylvania.

Berkshire Hathaway GUARD Insurance Companies ("GUARD") is a group of five insurance companies that provide a full suite of commercial insurance products, as well as homeowners policies to over 350,000 small to mid-sized businesses and homeowners. These offerings are made through independent agents and retail and wholesale brokers. GUARD is based in Wilkes-Barre, Pennsylvania.

MLMIC Insurance Company ("MLMIC") has been the leading writer of medical professional liability insurance in New York State for over 40 years. MLMIC distributes the majority of its policies on a direct basis to medical and dental professionals, health care providers and hospitals.

Berkshire Hathaway Reinsurance Group—Berkshire's combined global reinsurance business, referred to as the Berkshire Hathaway Reinsurance Group ("BHRG"), offers a wide range of coverages on property, casualty, life and health risks to insurers and reinsurers worldwide. BHRG conducts business activities in 24 countries. Reinsurance business is written through NICO and certain other Berkshire insurance subsidiaries (collectively, the "NICO Group") and General Re Corporation, domiciled in Delaware, and its subsidiaries (collectively the "General Re Group"). BHRG's underwriting operations in the U.S. are based in Stamford, Connecticut.

The type and volume of business written is dependent on market conditions, including prevailing premium rates and coverage terms. The level of underwriting activities often fluctuates significantly from year to year depending on the perceived level of price adequacy in specific insurance and reinsurance markets as well as from the timing of particularly large reinsurance transactions.

Property/casualty

The NICO Group offers traditional property/casualty reinsurance on both an excess-of-loss and a quota-share basis, catastrophe excess-of-loss treaty and facultative reinsurance, and primary insurance on an excess-of-loss basis for large or unusual risks. The type and volume of business written by the NICO Group may vary significantly from period to period resulting from changes in perceived premium rate adequacy and from unique or large transactions. A significant portion of NICO Group's annual reinsurance premium volume currently derives from a 20% quota-share agreement with Insurance Australia Group Limited ("IAG") that expires July 1, 2025. IAG is a multi-line insurer in Australia, New Zealand and other Asia-Pacific countries.

The General Re Group conducts a global property and casualty reinsurance business. Reinsurance contracts are written on both a quota-share and excess basis for multiple lines of business. Contracts are primarily in the form of treaties, and to a lesser degree, on a facultative basis. General Re Group conducts business in North America primarily through General Reinsurance Corporation ("GRC"), which is licensed in the District of Columbia and all states, except Hawaii, where it is an accredited reinsurer. GRC conducts operations in North America from its headquarters in Stamford, Connecticut and through 12 branch offices in the U.S. and Canada.

In North America, the General Re Group includes General Star National Insurance Company, General Star Indemnity Company and Genesis Insurance Company, which offer a broad array of specialty and surplus lines and property, casualty and professional liability coverages. Such business is marketed through a select group of wholesale brokers, managing general underwriters and program administrators, and offer solutions for the unique needs of public entity, commercial and captive customers.

General Re Group's international reinsurance business is conducted on a direct basis through General Reinsurance AG, based in Cologne, Germany, and through several other subsidiaries and branches in numerous other countries. International business is also written through brokers, including Faraday Underwriting Limited ("Faraday"), a wholly-owned subsidiary. Faraday owns the managing agent of Syndicate 435 at Lloyd's of London and provides capacity and participates in 100% of the results of Syndicate 435.

Life/health

The General Re Group also conducts a global life and health reinsurance business. In the U.S. and internationally, the General Re Group writes life, disability, supplemental health, critical illness and long-term care coverages. The life/health business is marketed on a direct basis. Life/health net premiums written by the General Re Group in 2021 were primarily in the Asia Pacific, United States and Western Europe.

Berkshire Hathaway Life Insurance Company of Nebraska ("BHLN"), a subsidiary of NICO, and its affiliates write reinsurance covering various forms of traditional life insurance exposures and, on a limited basis, health insurance exposures. BHLN and affiliates are parties to contracts that reinsure certain guaranteed minimum death, income and similar benefit risks on closed-blocks of variable annuity risks under reinsurance contracts, with the most recent contract incepting in 2014.

Retroactive reinsurance

NICO also periodically writes retroactive reinsurance contracts. Retroactive reinsurance contracts indemnify ceding companies against the adverse development of claims arising from loss events that have already occurred under property and casualty policies issued in prior years. Coverages under such contracts are provided on an excess basis (above a stated retention) or for losses payable after the inception of the contract with no additional ceding company retention. Contracts are normally subject to aggregate limits of indemnification, which can be exceptionally large in amount. Significant amounts of asbestos, environmental and latent injury claims may arise under these contracts.

The concept of time-value-of-money is an important element in establishing retroactive reinsurance contract prices and terms since loss payments may occur over decades. Normally, expected ultimate losses payable under these policies are expected to exceed premiums, thus producing underwriting losses. Nevertheless, this business is written, in part, because of the large amounts of policyholder funds generated for investment, the economic benefit of which will be reflected through investment results in future periods.

Periodic payment annuity

BHLN writes periodic payment annuity insurance policies and reinsures existing annuity-like obligations. Under these policies, BHLN receives upfront premiums and agrees in the future to make periodic payments that often extend for decades. These policies generally relate to the settlement of underlying personal injury or workers' compensation cases of other insurers, known as structured settlements. Consistent with retroactive reinsurance contracts, time-value-of-money concepts are an important factor in establishing annuity premiums, and underwriting losses are expected from the periodic accretion of time-value discounted liabilities.

Investments of insurance businesses—Berkshire's insurance subsidiaries hold significant levels of invested assets. Investment portfolios are primarily managed by Berkshire's Chief Executive Officer. Investments include a very large portfolio of publicly traded equity securities, which are concentrated in relatively few issuers, as well as fixed maturity securities and cash and short-term investments. Generally, there are no targeted allocations by investment type or attempts to match investment asset and insurance liability durations. However, investment portfolios have historically included a much greater proportion of equity securities than is customary in the insurance industry.

Invested assets derive from shareholder capital as well as funds provided from policyholders through insurance and reinsurance business ("float"). Float is the approximate amount of net policyholder funds generated through underwriting activities that is available for investment. The major components of float are unpaid losses and loss adjustment expenses, life, annuity and health benefit liabilities, unearned premiums and other policyholder liabilities less premium and reinsurance receivables, deferred policy acquisition costs and deferred charges on assumed retroactive reinsurance contracts. On a consolidated basis, float has grown from approximately $91 billion at the end of 2016 to approximately $147 billion at the end of 2021. The cost of float can be measured as the net pre-tax underwriting loss as a percentage of average float. In each of the three years ending December 31, 2021, Berkshire's consolidated cost of float was negative, as its insurance businesses produced net underwriting gains.

Railroad Business—Burlington Northern Santa Fe

Burlington Northern Santa Fe, LLC ("BNSF") is based in Fort Worth, Texas, and through BNSF Railway Company ("BNSF Railway") operates one of the largest railroad systems in North America. BNSF Railway had approximately 35,000 employees at the end of 2021. BNSF also operates a relatively smaller third-party logistics services business.

In serving the Midwest, Pacific Northwest, Western, Southwestern and Southeastern regions and ports of the United States, BNSF transports a range of products and commodities derived from manufacturing, agricultural and natural resource industries. Freight revenues are covered by contractual agreements of varying durations or common carrier published prices or company quotations. BNSF's financial performance is influenced by, among other things, general and industry economic conditions at the international, national and regional levels.

BNSF's primary routes, including trackage rights, allow it to access major cities and ports in the western and southern United States as well as parts of Canada and Mexico. In addition to major cities and ports, BNSF Railway efficiently serves many smaller markets by working closely with approximately 200 shortline railroads. BNSF Railway has also entered into marketing agreements with other rail carriers, expanding the marketing reach for each railroad and their customers. For the year ending December 31, 2021, approximately 38% of freight revenues were derived from consumer products, 24% from industrial products, 23% from agricultural products and 15% from coal.

Regulatory Matters

BNSF is subject to federal, state and local laws and regulations generally applicable to its businesses. Rail operations are subject to the regulatory jurisdiction of the Surface Transportation Board ("STB"), the Federal Railroad Administration of the United States Department of Transportation ("DOT"), the Occupational Safety and Health Administration ("OSHA"), as well as other federal and state regulatory agencies and Canadian regulatory agencies for operations in Canada. The STB has jurisdiction over disputes and complaints involving certain rates, routes and services, the sale or abandonment of rail lines, applications for line extensions and construction, and the merger with or acquisition of control of rail common carriers. The outcome of STB proceedings can affect the profitability of BNSF Railway's business.

The DOT and OSHA have jurisdiction under several federal statutes over a number of safety and health aspects of rail operations, including the transportation of hazardous materials. BNSF Railway is required to transport these materials to the extent of its common carrier obligation. State agencies regulate some aspects of rail operations with respect to health and safety in areas not otherwise preempted by federal law.

Environmental Matters

BNSF's rail operations, as well as those of its competitors, are also subject to extensive federal, state and local environmental regulation covering discharges to the ground or waters, air emissions, toxic substances and the generation, handling, storage, transportation and disposal of waste and hazardous materials. Such regulations effectively increase the costs and liabilities associated with rail operations. Environmental risks are also inherent in rail operations, which frequently involve transporting chemicals and other hazardous materials.

Many of BNSF's land holdings are or have been used for industrial or transportation-related purposes or leased to commercial or industrial companies whose activities may have resulted in discharges onto the property. Under federal (in particular, the Comprehensive Environmental Response, Compensation and Liability Act) and state statutes, BNSF may be held jointly and severally liable for cleanup and enforcement costs associated with a particular site without regard to fault or the legality of the original conduct. BNSF may also be subject to claims by third parties for investigation, cleanup, restoration or other environmental costs under environmental statutes or common law with respect to properties they own that have been impacted by BNSF operations.

Consumption of diesel fuel by locomotives accounted for approximately 80% of BNSF's greenhouse gas ("GHG") emissions in its baseline year of 2018. BNSF management has committed to a broad sustainability model, applying science-based approaches, that will provide a 30% reduction in BNSF's GHG-emissions by 2030 from its baseline year of 2018. BNSF intends to continue improvements in fuel efficiency and increased utilization of renewable diesel fuel. Long-term solutions, such as battery-electric and hydrogen locomotives, are also being evaluated and field-tested.

Competition

The business environment in which BNSF operates is highly competitive. Depending on the specific market, deregulated motor carriers and other railroads, as well as river barges, ships and pipelines, may exert pressure on price and service levels. The presence of advanced, high service truck lines with expedited delivery, subsidized infrastructure and minimal empty mileage continues to affect the market for non-bulk, time-sensitive freight. The potential expansion of longer combination vehicles could further encroach upon markets traditionally served by railroads. In order to remain competitive, BNSF Railway and other railroads seek to develop and implement operating efficiencies to improve productivity.

As railroads streamline, rationalize and otherwise enhance their franchises, competition among rail carriers intensifies. BNSF Railway's primary rail competitor in the Western region of the United States is the Union Pacific Railroad Company. Other Class I railroads and numerous regional railroads and motor carriers also operate in parts of the same territories served by BNSF Railway.

Utilities and Energy Businesses—Berkshire Hathaway Energy

Berkshire currently has a 91.1% ownership interest in Berkshire Hathaway Energy Company ("BHE"). BHE is a global energy company with subsidiaries and affiliates that generate, transmit, store, distribute and supply energy. BHE's locally managed businesses are organized as separate operating units. BHE's domestic regulated energy interests are comprised of four regulated utility companies serving approximately 5.2 million retail customers, five interstate natural gas pipeline companies with approximately 21,100 miles of operated pipeline having a design capacity of approximately 21 billion cubic feet of natural gas per day and ownership interests in electricity transmission businesses. BHE's Great Britain electricity distribution subsidiaries serve about 3.9 million electricity end-users and its electricity transmission-only business in Alberta, Canada serves approximately 85% of Alberta's population. BHE's interests also include a diversified portfolio of independent power projects, a liquefied natural gas export, import and storage facility, the largest residential real estate brokerage firm in the United States, and one of the largest residential real estate brokerage franchise networks in the United States. BHE employs approximately 24,000 people in connection with its various operations.

General Matters

PacifiCorp is a regulated electric utility company headquartered in Oregon, serving electric customers in portions of Utah, Oregon, Wyoming, Washington, Idaho and California. The combined service territory's diverse regional economy ranges from rural, agricultural and mining areas to urban, manufacturing and government service centers. No single segment of the economy dominates the combined service territory, which helps mitigate PacifiCorp's exposure to economic fluctuations. In addition to retail sales, PacifiCorp sells electricity on a wholesale basis.

MidAmerican Energy Company ("MEC") is a regulated electric and natural gas utility company headquartered in Iowa, serving electric and natural gas customers primarily in Iowa and also in portions of Illinois, South Dakota and Nebraska. MEC has a diverse retail customer base consisting of urban and rural residential customers and a variety of commercial and industrial customers. In addition to retail sales and natural gas transportation, MEC sells electricity and natural gas on a wholesale basis.

NV Energy, Inc. ("NV Energy") is an energy holding company headquartered in Nevada, primarily consisting of two regulated utility subsidiaries, Nevada Power Company ("Nevada Power") and Sierra Pacific Power Company ("Sierra Pacific") (collectively, the "Nevada Utilities"). Nevada Power serves retail electric customers in southern Nevada and Sierra Pacific serves retail electric and natural gas customers in northern Nevada. The Nevada Utilities' combined service territory's economy includes gaming, mining, recreation, warehousing, manufacturing and governmental services. In addition to retail sales and natural gas transportation, the Nevada Utilities sell electricity and natural gas on a wholesale basis.

As vertically integrated utilities, BHE's domestic utilities own approximately 29,400 net megawatts of generation capacity in operation and under construction. The domestic utilities business is subject to seasonal variations principally related to the use of electricity for air conditioning and natural gas for heating. Typically, regulated electric revenues are higher in the summer months, while regulated natural gas revenues are higher in the winter months.

The Great Britain distribution companies consist of Northern Powergrid (Northeast) plc and Northern Powergrid (Yorkshire) plc, which own a substantial electricity distribution network that delivers electricity to end-users in northeast England in an area covering approximately 10,000 square miles. The distribution companies primarily charge supply companies regulated tariffs for the use of their distribution systems.

AltaLink L.P. ("AltaLink") is a regulated electric transmission-only utility company headquartered in Calgary, Alberta. AltaLink's high voltage transmission lines and related facilities transmit electricity from generating facilities to major load centers, cities and large industrial plants throughout its 87,000 square mile service territory.

The natural gas pipelines consist of BHE GT&S, LLC ("BHE GT&S"), Northern Natural Gas Company ("Northern Natural") and Kern River Gas Transmission Company ("Kern River"). BHE GT&S was acquired on November 1, 2020.

BHE GT&S, based in Virginia, operates three interstate natural gas pipeline systems that consist of approximately 5,400 miles of natural gas transmission, gathering and storage pipelines and operates seventeen underground natural gas storage fields in the eastern region of the United States. BHE GT&S's large underground natural gas storage assets and pipeline systems are part of an interconnected gas transmission network that provides transportation services to utilities and numerous other customers. BHE GT&S is also an industry leader in liquefied natural gas solutions through its investments in and ownership of several liquefied natural gas facilities located throughout the eastern region of the United States.

Northern Natural, based in Nebraska, operates the largest interstate natural gas pipeline system in the United States, as measured by pipeline miles, reaching from west Texas to Michigan's Upper Peninsula. Northern Natural's pipeline system consists of approximately 14,300 miles of natural gas pipelines. Northern Natural's extensive pipeline system, which is interconnected with many interstate and intrastate pipelines in the national grid system, has access to supplies from multiple major supply basins and provides transportation services to utilities and numerous other customers. Northern Natural also operates three underground natural gas storage facilities and two liquefied natural gas storage peaking units. Northern Natural's pipeline system experiences significant seasonal swings in demand and revenue, with the highest demand typically occurring during the months of November through March.

Kern River, based in Utah, operates an interstate natural gas pipeline system that consists of approximately 1,400 miles and extends from supply areas in the Rocky Mountains to consuming markets in Utah, Nevada and California. Kern River transports natural gas for electric and natural gas distribution utilities, major oil and natural gas companies or affiliates of such companies, electric generating companies, energy marketing and trading companies, and financial institutions.

BHE Renewables, based in Iowa, owns interests in independent power projects having approximately 4,900 net megawatts of generation capacity that are in service in California, Texas, Illinois, Nebraska, New York, Arizona, Minnesota, Kansas, Iowa and Hawaii. These independent power projects sell power generated primarily from wind, solar, geothermal and hydro sources under long-term contracts. Additionally, $6.9 billion has been invested in wind projects sponsored by third parties, commonly referred to as tax equity investments.

Regulatory Matters

PacifiCorp, MEC and the Nevada Utilities are subject to comprehensive regulation by various federal, state and local agencies. The Federal Energy Regulatory Commission ("FERC") is an independent agency with broad authority to implement provisions of the Federal Power Act, the Energy Policy Act of 2005 and other federal statutes. The FERC regulates rates for wholesale sales of electricity; transmission of electricity, including pricing and regional planning for the expansion of transmission systems; electric system reliability; utility holding companies; accounting and records retention; securities issuances; construction and operation of hydroelectric facilities; and other matters. The FERC also has the enforcement authority to assess civil penalties of up to $1.4 million per day per violation of rules, regulations and orders issued under the Federal Power Act. MEC is also subject to regulation by the Nuclear Regulatory Commission pursuant to the Atomic Energy Act of 1954, as amended, with respect to its 25% ownership of the Quad Cities Nuclear Station.

With certain limited exceptions, BHE's domestic utilities have an exclusive right to serve retail customers within their service territories and, in turn, have an obligation to provide service to those customers. In some jurisdictions, certain classes of customers may choose to purchase all or a portion of their energy from alternative energy suppliers, and in some jurisdictions retail customers can generate all or a portion of their own energy. Historically, state regulatory commissions have established retail electric and natural gas rates on a cost-of-service basis, designed to allow a utility the opportunity to recover what each state regulatory commission deems to be the utility's reasonable costs of providing services, including a fair opportunity to earn a reasonable return on its investments based on its cost of debt and equity. The retail electric rates of PacifiCorp, MEC and the Nevada Utilities are generally based on the cost of providing traditional bundled services, including generation, transmission and distribution services; however, rates are available for transmission-only and distribution-only services.

Northern Powergrid (Northeast) and Northern Powergrid (Yorkshire) each charge fees for the use of their distribution systems that are controlled by a formula prescribed by the British electricity regulatory body, the Gas and Electricity Markets Authority. The current eight-year price control period runs from April 1, 2015 through March 31, 2023.

AltaLink is regulated by the Alberta Utilities Commission ("AUC"), pursuant to the Electric Utilities Act (Alberta), the Public Utilities Act (Alberta), the Alberta Utilities Commission Act (Alberta) and the Hydro and Electric Energy Act (Alberta). The AUC is an independent quasi-judicial agency, which regulates and oversees Alberta's electricity transmission sector with broad authority that may impact many of AltaLink's activities, including its tariffs, rates, construction, operations and financing. Under the Electric Utilities Act, AltaLink prepares and files applications with the AUC for approval of tariffs to be paid by the Alberta Electric System Operator ("AESO") for the use of its transmission facilities, and the terms and conditions governing the use of those facilities. The AESO is an independent system operator in Alberta, Canada that oversees Alberta's integrated electrical system ("AIES") and wholesale electricity market. The AESO is responsible for directing the safe, reliable and economic operation of the AIES, including long-term transmission system planning.

The natural gas pipelines are subject to regulation by various federal and state agencies. The natural gas pipeline and storage operations of BHE GT&S, Northern Natural and Kern River are regulated by the FERC pursuant to the Natural Gas Act and the Natural Gas Policy Act of 1978. Under this authority, the FERC regulates, among other items, (a) rates, charges, terms and conditions of service; (b) the construction and operation of interstate pipelines, storage and related facilities, including the extension, expansion or abandonment of such facilities; and (c) the construction and operation of liquefied natural gas import/export facilities. Interstate natural gas pipeline companies are also subject to regulations administered by the Office of Pipeline Safety within the Pipeline and Hazardous Materials Safety Administration, an agency of the DOT. Federal pipeline safety regulations are issued pursuant to the Natural Gas Pipeline Safety Act of 1968, as amended, which establishes safety requirements in the design, construction, operation and maintenance of interstate natural gas pipeline facilities.

Environmental Matters

BHE and its energy businesses are subject to federal, state, local and foreign laws and regulations regarding climate change, renewable portfolio standards, air and water quality, emissions performance standards, coal combustion byproduct disposal, hazardous and solid waste disposal, protected species and other environmental matters that have the potential to impact current and future operations. In addition to imposing continuing compliance obligations, these laws and regulations, such as the Federal Clean Air Act, provide regulators with the authority to levy substantial penalties for noncompliance, including fines, injunctive relief and other sanctions.

The Federal Clean Air Act, as well as state laws and regulations impacting air emissions, provides a framework for protecting and improving the nation's air quality and controlling sources of air emissions. These laws and regulations continue to be promulgated and implemented and will impact the operation of BHE's generating facilities and require them to reduce emissions at those facilities to comply with the requirements.

Renewable portfolio standards have been established by certain state governments and generally require electricity providers to obtain a minimum percentage of their power from renewable energy resources by a certain date. Utah, Oregon, Washington, California, Iowa and Nevada have adopted renewable portfolio standards. In addition, the potential adoption of state or federal clean energy standards, which include low-carbon, non-carbon and renewable electricity generating resources, may also impact electricity generators and natural gas providers.

In December 2015, an international agreement was negotiated by 195 nations to create a universal framework for coordinated action on climate change in what is referred to as the Paris Agreement. The Paris Agreement reaffirms the goal of limiting global temperature increase well below 2 degrees Celsius, while urging efforts to limit the increase to 1.5 degrees Celsius; establishes commitments by all parties to make nationally determined contributions and pursue domestic measures aimed at achieving the commitments; commits all countries to submit emissions inventories and report regularly on their emissions and progress made in implementing and achieving their nationally determined commitments; and commits all countries to submit new commitments every five years, with the expectation that the commitments will get more aggressive. In the context of the Paris Agreement, the United States agreed to reduce greenhouse gas emissions 26% to 28% by 2025 from 2005 levels. The Paris Agreement formally entered into force on November 4, 2016. The United States completed its withdrawal from the Paris Agreement on November 4, 2020. President Biden accepted the terms of the climate agreement on January 21, 2021, and the United States completed its reentry on February 19, 2021. New commitments to the Paris Agreement were announced in April 2021, with the United States pledging to cut its overall greenhouse gas emissions by 50-52% below 2005 levels by 2030 and to reach 100% carbon pollution-free electricity by 2035.

On October 10, 2017, the Environmental Protection Agency ("EPA") issued a proposal to repeal the Clean Power Plan, which was intended to achieve an overall reduction in carbon dioxide emissions from existing fossil-fueled electric generating units of 32% below 2005 levels. On June 19, 2019, the EPA repealed the Clean Power Plan and issued the Affordable Clean Energy rule, which fully replaced the Clean Power Plan. In the Affordable Clean Energy rule, the EPA determined that the best system of emissions reduction for existing coal fueled power plants is heat rate improvements and identified a set of candidate technologies and measures that could improve heat rates. Measures taken to meet the standards of performance must be achieved at the source itself. On January 19, 2021, the D.C. Circuit Court of Appeals vacated the Affordable Clean Energy Rule in its entirety. In October 2021, the U.S. Supreme Court agreed to hear an appeal of that decision. Arguments in the case will be held in February 2022 and a decision regarding the scope of the EPA's authority to regulate greenhouse gas emissions under the Clean Air Act is expected by June 2022. Increasingly, states are adopting legislation and regulations to reduce greenhouse gas emissions, and local governments and consumers are seeking increasing amounts of clean and renewable energy.

BHE and its energy subsidiaries continue to focus on delivering reliable, affordable, safe and clean energy to its customers and on actions to mitigate its greenhouse gas ("GHG") emissions. BHE's primary source of GHG emissions is the generation of electricity from its power plants that are fueled by coal or natural gas. In managing its electricity generation, BHE works with its regulators to protect the energy and economic needs of customers by considering costs, reliability and sources of electric generation. Over the years, BHE has invested heavily in owned wind, solar and geothermal generation, with cumulative investments of $30.1 billion through 2021 and has retired 16 coal generation units. As a result, BHE has reduced its annual GHG emissions by about 20% from 2005 levels. BHE plans to continue investing in wind, solar and other low-carbon generation in the future and to retire an additional 16 coal generation units between 2022 and 2030 in a reliable and cost-effective manner, thereby achieving a 50% reduction in GHG emissions from 2005 levels in 2030.

Non-Energy Businesses

HomeServices of America, Inc. ("HomeServices") is the largest residential real estate brokerage firm in the United States. In addition to providing traditional residential real estate brokerage services, HomeServices offers other integrated real estate services, including mortgage originations and mortgage banking, title and closing services, property and casualty insurance, home warranties, relocation services and other home-related services. It operates under 55 brand names with approximately 46,000 real estate agents in over 900 brokerage offices in 33 states and the District of Columbia.

HomeServices' franchise network currently includes approximately 360 franchisees primarily in the United States, and internationally in over 1,600 brokerage offices with over 53,000 real estate agents under two brand names. In exchange for certain fees, HomeServices provides the right to use the Berkshire Hathaway HomeServices or Real Living brand names and other related service marks, as well as providing orientation programs, training and consultation services, advertising programs and other services.

HomeServices' principal sources of revenue are dependent on residential real estate sales, which are generally higher in the second and third quarters of each year. This business is highly competitive and subject to general real estate market conditions.

Manufacturing Businesses

Berkshire's numerous and diverse manufacturing subsidiaries are grouped into three categories: (1) industrial products, (2) building products and (3) consumer products. Berkshire's industrial products businesses manufacture components for aerospace and power generation applications, specialty chemicals, metal cutting tools, and a variety of other products primarily for industrial use. The building products group produces prefabricated and site-built residential homes, flooring products, insulation, roofing and engineered products, building and engineered components, paint and coatings and bricks and masonry products. The consumer products group manufactures recreational vehicles, alkaline batteries, various apparel products, jewelry and custom picture framing products. Information concerning the major activities of these three groups follows. Berkshire's manufacturing businesses employed approximately 187,000 people at the end of 2021.

Industrial products

Precision Castparts

Precision Castparts Corp. ("PCC") manufactures complex metal components and products, provides high-quality investment castings, forgings, fasteners/fastener systems and aerostructures for critical aerospace and power and energy applications. PCC also manufactures seamless pipe for coal-fired, industrial gas turbine ("IGT") and nuclear power plants; downhole casing and tubing, fittings and various mill forms in a variety of nickel and steel alloys for severe-service oil and gas environments; investment castings and forgings for general industrial, armament, medical and other applications; nickel and titanium alloys in all standard mill forms from large ingots and billets to plate, foil, sheet, strip, tubing, bar, rod, extruded shapes, rod-in-coil, wire and welding consumables, as well as cobalt alloys, for the aerospace, chemical processing, oil and gas, pollution control and other industries; revert management solutions; fasteners for automotive and general industrial markets; specialty alloys for the investment casting and forging industries; heat treating and destructive testing services for the investment cast products and forging industries; grinder pumps and affiliated components for low-pressure sewer systems; critical auxiliary equipment and gas monitoring systems for the power generation industry; and metalworking tools for the fastener market and other applications.

Investment casting technology involves a multi-step process that uses ceramic molds in the manufacture of metal components with more complex shapes, closer tolerances and finer surface finishes than parts manufactured using other methods. PCC uses this process to manufacture products for aircraft engines, IGT and other aeroderivative engines, airframes, medical implants, armament, unmanned aerial vehicles and other industrial applications. PCC also manufactures high temperature carbon and ceramic composite components, including ceramic matrix composites, for use in next-generation aerospace engines.

PCC uses forging processes to manufacture components for the aerospace and power generation markets, including seamless pipe for coal-fired, IGT and nuclear power plants, and downhole casings and tubing pipe for severe service oil and gas markets. PCC manufactures high-performance, nickel-based alloys used to produce forged components for aerospace and non-aerospace applications in such markets as oil and gas, chemical processing and pollution control. These titanium products are used to manufacture components for the commercial and military aerospace, power generation, energy and other industrial end markets.

PCC is also a leading developer and manufacturer of highly engineered fasteners, fastener systems, aerostructures and precision components, primarily for critical aerospace applications. These products are produced for the aerospace and power and energy markets, as well as for construction, automotive, heavy truck, farm machinery, mining and construction equipment, shipbuilding, machine tools, medical equipment, appliance and recreation markets.

PCC has several significant customers, including aerospace original equipment manufacturers (Boeing and Airbus) and aircraft engine manufacturer suppliers (General Electric, Rolls Royce and Pratt &Whitney). The majority of PCC's sales are from customer orders or demand schedules pursuant to long-term agreements. Contractual terms may provide for termination by the customer, subject to payment for work performed. PCC typically does not experience significant order cancellations, although periodically it receives requests for delays in delivery schedules. Since the onset of the COVID-19 pandemic in 2020, delay requests increased, with delivery dates extending in some cases beyond 2021.

The effects of the COVID-19 pandemic produced significant adverse effects on the PCC aerospace business in 2020 and 2021. The sudden and material reductions in air travel led to aircraft build rate reductions and customer destocking at extraordinary rates. The grounding of the Boeing 737 MAX also adversely impacted 2020 and 2021 and quality issues with the Boeing 787 negatively impacted 2021. Aircraft build rates have not recovered in any meaningful way. During 2020, PCC significantly reduced its worldwide workforce by about 40% to help align operations to reduced aircraft build rates. The restructuring actions taken began to improve margins in late 2020 and further margin improvements were achieved in 2021.

PCC is subject to substantial competition in all of its markets. Components and similar products may be produced by competitors, who use either the same types of manufacturing processes as PCC or other processes. Although PCC believes its manufacturing processes, technology and experience provide advantages to its customers, such as high quality, competitive prices and physical properties that often meet more stringent demands, alternative forms of manufacturing can be used to produce many of the same components and products. Despite intense competition, PCC is a leading supplier in most of its principal markets. Several factors, including long-standing customer relationships, technical expertise, state-of-the-art facilities and dedicated employees, aid PCC in maintaining competitive advantages.

Several raw materials used in PCC products, including certain metals such as nickel, titanium, cobalt, tantalum and molybdenum, are found in only a few parts of the world. These metals are required for the alloys used in manufactured products. The availability and costs of these metals may be influenced by private or governmental cartels, changes in world politics, labor relations between the metal producers and their workforces and inflation.

PCC is currently subject to various federal, state and foreign environmental laws concerning, among other things, water discharges, air emissions, waste management, toxic materials use reduction and environmental cleanup. Laws and regulations continue to evolve, and it is reasonably possible that environmental standards will become more stringent in the future, particularly under air quality and water quality laws and standards related to climate change, including reporting of greenhouse gas emissions. As a result, it is also reasonably likely that PCC will be regularly required to make additional expenditures, including capital expenditures, which could be significant, relating to environmental matters.

Lubrizol

The Lubrizol Corporation ("Lubrizol") is a specialty chemical and performance materials company that manufactures products and supplies technologies for the global transportation, industrial and consumer markets. Lubrizol currently operates two business segments: Lubrizol Additives, which produces engine lubricant additives, driveline lubricant additives and industrial specialties products; and Lubrizol Advanced Materials, which includes engineered materials (engineered polymers and performance coatings) and life sciences (beauty and personal care, and health and home care solutions).

Lubrizol Additives' products are used in a broad range of applications including engine oils, transmission fluids, gear oils, specialty driveline lubricants, fuels, metalworking fluids and compressor lubricants for transportation and industrial applications. Lubrizol Advanced Materials' products are used in many different types of applications including beauty, personal care, home care, over-the-counter pharmaceuticals, medical devices, performance coatings, sporting goods, plumbing and fire sprinkler systems. Lubrizol is an industry leader in many of the markets in which it competes, and its principal lubricant additives competitors are Infineum International Ltd., Chevron Oronite Company and Afton Chemical Corporation. Lubrizol Advanced Materials' businesses compete in many markets with a variety of competitors in each product line.

With its considerable patent portfolio, Lubrizol uses its technological leadership position and applies its science capabilities, formulation know-how and market expertise in product development to improve the demand, quality and value of its solutions. Lubrizol also leverages its scientific and applications knowledge to meet and exceed customer performance and sustainability requirements. While Lubrizol typically has patents that expire each year, it invests resources to protect its intellectual property and to develop or acquire innovative products for the markets it serves. Lubrizol uses many specialty and commodity chemical raw materials in its manufacturing processes. Raw materials are primarily feedstocks derived from petroleum and petrochemicals and, generally, are obtainable from several sources. The materials that Lubrizol chooses to purchase from a single source typically are subject to long-term supply contracts to ensure supply reliability.

Lubrizol operates its business on a global basis through more than 100 offices, laboratories, production facilities and warehouses on six continents, the most significant of which are North America, Europe, Asia and South America. Lubrizol markets its products worldwide through direct sales, sales agents and distributors. Lubrizol's customers principally consist of major global and regional oil companies and industrial and consumer products companies. Some of Lubrizol's largest customers also may be suppliers. During 2021, no single customer accounted for more than 10% of Lubrizol's consolidated revenues. In 2021, the COVID-19 pandemic continued to have an adverse effect on many of the markets that Lubrizol serves, as did worldwide supply chain disruptions, affecting both the availability of raw materials and fulfillment of customer orders. In addition, the occurrence and duration of the February 2021 winter storms and freezing temperatures in Texas significantly interrupted operations at Lubrizol's manufacturing facilities.

Lubrizol expends significant capital to ensure the safety of its employees and the communities where it operates, as well as delivering on its commitments to operational excellence and cybersecurity. Lubrizol also makes significant capital investments to ensure reliable supply and compliance with regulations governing its operations, while reducing their environmental footprint.

Lubrizol is subject to foreign, federal, state and local laws to protect the environment, limit manufacturing waste and emissions, ensure product and employee safety and regulate trade. While the company believes that its policies, practices and procedures are designed to limit the risks of non-compliance with laws and consequent financial liability, it experienced a fire at one of its chemical manufacturing facilities in 2019, which resulted in significant cleanup and remediation costs. Lubrizol also suffered a fire in 2021 that resulted in a total loss of its grease manufacturing facility. The operation of chemical manufacturing plants entails ongoing environmental and other risks, and significant capital expenditures, costs or liabilities could be incurred in the future.

IMC

IMC International Metalworking Companies ("IMC") is one of the world's three largest multinational manufacturers of consumable precision carbide metal cutting tools for applications in a broad range of industrial end markets. IMC's principal brand names include ISCAR®, TaeguTec®, Ingersoll®, Tungaloy®, Unitac®, UOP®, It.te.di®, Qutiltec®, Tool—Flo®, PCT® and IMCO®. IMC's primary manufacturing facilities are in Israel, the United States, South Korea, Japan, Germany, Italy, Switzerland, India and China.

IMC has five primary product lines: milling tools, gripping tools, turning/thread tools, drilling tools and tooling. The main products are split within each product line between consumable cemented tungsten carbide inserts and steel tool holders. Inserts comprise the vast majority of sales and earnings. Metal cutting inserts are used by industrial manufacturers to cut metals and are consumed during their use in cutting applications. IMC manufactures hundreds of types of highly engineered inserts within each product line that are tailored to maximize productivity and meet the technical requirements of customers. IMC's staff of scientists and engineers continuously develop and innovate products that address end user needs and requirements.

IMC's global sales and marketing network operates in virtually every major manufacturing center around the world, staffed with highly skilled engineers and technical personnel. IMC's customer base is very diverse, with its primary customers being large, multinational businesses in the automotive, aerospace, engineering and machinery industries. IMC operates a regional central warehouse system with locations in Israel, the United States, Belgium, Korea, Japan and China. Additional small quantities of products are maintained at local IMC offices to provide on-time customer support and inventory management.

IMC competes in the metal cutting tools segment of the global metalworking tools market. The segment includes hundreds of participants who range from small, private manufacturers of specialized products for niche applications and markets to larger, global multinational businesses (such as Sandvik and Kennametal, Inc.) with a wide assortment of products and extensive distribution networks. Other manufacturing companies such as Kyocera, Mitsubishi, Sumitomo, Ceratizit and Korloy also play a significant role in the cutting tool market.

Cemented tungsten carbide powder is the main raw material used in manufacturing cutting tools. Most of IMC's metalworking insert products are made from tungsten. While supplies are currently adequate, a significant disruption or constraints in production processing facilities could cause a price increase.

IMC is committed to follow, comply and obey all government and environmental regulations and requirements of all applicable laws. IMC considers environmental preservation and pollution prevention as important factors in all operations and activities. IMC production facilities are built with the highest standards and follow all applicable regulations.

Marmon

Marmon Holdings, Inc. ("Marmon") is a global industrial organization comprising 11 diverse business groups and more than 100 autonomous manufacturing and service businesses. Marmon's manufacturing and service operations are conducted at approximately 400 manufacturing, distribution and service facilities located primarily in the United States, as well as 22 other countries worldwide. Marmon's business groups are as follows.

Foodservice Technologies manufactures beverage dispensing and cooling equipment, hot and cold food preparation and holding equipment and related products for restaurants, global brand owners and other foodservice providers. Operations are based in the U.S. with manufacturing in the U.S., Mexico, China, the U.K., Germany and Italy. Products are sold primarily throughout the U.S., Europe and Asia.

Water Technologies manufactures water treatment equipment for residential, commercial and industrial applications worldwide. Operations are based primarily in the U.S., Canada, China, Singapore, India and Mexico with business centers located in Belgium, France, Poland, Germany, the U.K., Italy, Switzerland and U.A.E.

Transportation Products serves the automotive, heavy-duty highway transportation and aerospace industries with precision-molded plastic components; fastener thread solutions; metal tubing; auto aftermarket transmission and chassis products; platform and lowbed trailers; and truck and trailer components. Operations and business are conducted primarily in the U.S., Mexico, Canada, Europe and Asia.

Retail Solutions provides retail environment design services; in-store digital merchandising, dispensing and display fixtures; shopping, material handling and security carts. Operations and business are conducted in the U.S., U.K. and Czech Republic.

Metal Services provides specialty metal pipe, tubing and related value-added services to customers across a broad range of industries. Operations are based in the U.S., Canada and Mexico and business is conducted primarily in those countries.

Electrical produces electrical wire for use in residential and commercial buildings, and specialty wire and cable for use in energy, transit, aerospace, defense, communication and other industrial applications. Operations are based in the U.S., Canada, India and England. Business is conducted globally and primarily in the U.S., Canada, India, the U.K., U.A.E. and China.

Plumbing & Refrigeration supplies copper tubing and copper, brass, aluminum and stainless-steel fittings and components for the plumbing, HVAC and refrigeration markets; custom coils ducting, air handling units and heatpipe for the HVAC market; HVAC systems and structures for military, nuclear and medical markets and aluminum and brass forgings for many commercial and industrial applications. Business and operations are conducted primarily in the U.S.

Industrial Products supplies construction fasteners; masonry and stone anchoring systems used in commercial construction; two component polymer products for anchoring, bonding and repair applications, gloves and other protective wear; gear drives, gearboxes, fan drives and pump drives for various markets; wind machines for agricultural use; and wheels, axles and gears for rail, mining and other applications and equipment for the manufacture and assembly of lead acid batteries. Operations are primarily based in the U.S., U.K., Canada and China and business is conducted in those countries.

Rail & Leasing manufactures, leases and maintains railcars; leases intermodal tank containers; manufactures mobile railcar movers; provides in-plant rail switching and loading services; performs track construction and maintenance; and manufactures steel tank heads and cylinders.

Union Tank Car Company ("UTLX") is the largest component of Rail & Leasing and is a leading designer, builder and full-service lessor of railroad tank cars and other specialized railcars. Together with its Canadian affiliate Procor, UTLX owns a fleet of approximately 122,000 railcars for lease to customers in chemical, petrochemical, energy and agricultural/food industries. UTLX manufactures tank cars in the U.S. and performs railcar maintenance services at more than 100 locations across North America.

UTLX has a diversified customer base, both geographically and across industries. UTLX, while subject to cyclicality and significant competition in most of its markets, competes by offering a broad range of high-quality products and services targeted at its niche markets. Railcars are typically leased for multiple-year terms and most of the leases are renewed upon expiration. Due to selective ongoing capital investment, utilization rates (the number of railcars on lease as a percentage of the total fleet) of the railcar fleet are generally high.

Intermodal tank containers are leased through EXSIF Worldwide. EXSIF is a leading international lessor of intermodal tank containers with a fleet of approximately 75,000 units, primarily serving chemical producers and logistics operators.

Crane Services is a provider of mobile cranes and operators in North America and Australia with a combined fleet of approximately 1,100 cranes, primarily serving the energy, mining, petrochemical and infrastructure markets.

Medical (formed in 2019 through the acquisition of the Colson Medical Companies) develops, manufactures and distributes a wide range of innovative medical devices in the extremities fixation, craniomaxillofacial surgery, neurosurgery, biologics, aesthetics and powered instruments markets. The group's leading-edge medical technology and products are used globally to help improve patient care and outcomes. Operations are based in the U.S., Europe and China. Business is conducted primarily in North and South America, Europe, Asia and Australia.

Certain Marmon business, including the Rail and Medical groups, are subject to government regulation and oversight. Marmon has numerous known environmental matters which are subject to on-going monitoring and/or remediation efforts. Marmon follows all federal, state and local environmental regulations.

Other industrial products

CTB International Corp. ("CTB"), headquartered in Milford, Indiana, is a leading global designer, manufacturer and marketer of a wide range of agricultural systems and solutions for preserving grain, producing poultry, pigs and eggs, and for processing poultry, fish, vegetables and other foods. CTB operates from facilities located around the globe and supports customers through a worldwide network of independent distributors and dealers.

CTB competes with a variety of manufacturers and suppliers, many of which offer only a limited number of the products offered by CTB and four of which offer products across several of CTB's product lines. Competition is based on the price, value, reputation, quality and design of the products offered and the customer service provided by distributors, dealers and manufacturers of the products. CTB's leading brand names, distribution network, diversified product line, product support and high-quality products enable it to compete effectively. CTB manufactures its products primarily from galvanized steel, steel wire, stainless steel and polymer materials and supplies of these materials have been sufficient in recent years.

LiquidPower Specialty Products Inc. ("LSPI"), headquartered in Houston, Texas, is a global leader in the science of drag reduction application ("DRA") technology by maximizing the flow potential of pipelines, increasing operational flexibility and throughput capacity, and efficiencies for customers. LSPI develops innovative flow improver solutions with customers in over 20 countries on five continents, treating over 50 million barrels of hydrocarbon liquids per day. LSPI's DRA offering is part of a comprehensive, full-service solution that encompasses industry-leading technology, quality manufacturing, technical support and consulting, a reliable supply chain, injection equipment and field service. LSPI is subject to foreign, federal, state and local laws to protect the environment and limit manufacturing waste and emissions.

The Scott Fetzer companies are a group of businesses that manufacture, distribute, service and finance a wide variety of products for residential, industrial and institutional use.

Building Products

Clayton

Clayton Homes, Inc. ("Clayton"), headquartered near Knoxville, Tennessee, is a vertically integrated housing company offering traditional site-built homes and off-site built housing, including modular, manufactured, CrossMod™ and tiny homes. In 2021, Clayton delivered approximately 50,000 off-site built and 11,000 site-built homes. Clayton also offers home financing and insurance products and competes on price, service, location and delivery capabilities.

All Clayton Built® off-site homes are designed, engineered and assembled in the United States. As of December 2021, off-site backlog was $1.4 billion, up 10% from the prior year. Clayton sells its homes through independent and company-owned home centers, realtors and subdivision channels. Clayton considers its ability to make financing available to retail purchasers a factor affecting the market acceptance of its off-site built homes. Clayton's financing programs utilize proprietary loan underwriting guidelines to evaluate loan applicants, which include ability to repay calculations, including debt to income limits, and incorporate residual income and credit score requirements.

Since 2015, Clayton's site-built division, Clayton Properties Group, has expanded through the acquisition of nine builders across 14 states with over 300 subdivisions, supplementing the portfolio of housing products offered to customers. Clayton's site-builders currently own and control approximately 83,000 homesites, with a home order backlog of approximately $2.5 billion.

Historically, access to key inputs such as lumber, steel and resin products has been adequate. During 2021, the availability and pricing of these and other inputs has been volatile. Input shortages coupled with labor and subcontractor availability have increased the time to construct a home, constraining our ability to meet current demand.

Clayton's home building business regularly makes capital and non-capital expenditures with respect to compliance with federal, state and local environmental regulations, primarily related to erosion control, permitting and stormwater protection for site-built home subdivisions. The financing business originates and services loans which are federally regulated by the Consumer Financial Protection Bureau, various state regulatory agencies and reviewed by the U.S. Department of Housing and Urban Development, the Government National Mortgage Association and government-sponsored enterprises.

Shaw

Shaw Industries Group, Inc. ("Shaw"), headquartered in Dalton, Georgia, is a leading manufacturer and distributor of carpet and flooring products. Shaw designs and manufactures over 4,100 styles of tufted carpet, wood and resilient flooring for residential and commercial use under about 30 brand and trade names and under certain private labels. Shaw also provides project management and installation services. Shaw's manufacturing operations are fully integrated from the processing of raw materials used to make fiber through the finishing of carpet. Shaw manufactures and distributes carpet tile throughout Europe. Shaw also manufactures or distributes a variety of hardwood, wood plastic composite (WPC), stone plastic composite (SPC) and vinyl and laminate floor products ("hard surfaces"). Shaw's soft and hard surface products are sold in a broad range of patterns, colors and textures. Shaw operates Shaw Sports Turf and Southwest Greens International, LLC, which provide synthetic sports turf, golf greens and landscape turf products. In 2021, Shaw's businesses include Watershed Geosynthetics, LLC, which sells innovative and patented environmental solutions for utility, waste management, erosion control and mining industries.

Shaw products are sold wholesale to over 47,000 retailers, distributors and commercial users throughout the United States, Canada and Mexico and are also exported to various overseas markets. Shaw's wholesale products are marketed domestically by over 2,100 salaried and commissioned sales personnel directly to retailers and distributors and to large national accounts. Shaw's seven carpet, nine hard surface, one sample full-service distribution facility, three sample satellite locations and 30 redistribution centers, along with centralized management information systems, enable it to provide prompt and efficient delivery of its products to both its retail customers and wholesale distributors.

Substantially all carpet manufactured by Shaw is tufted carpet made from nylon, polypropylene and polyester. In the tufting process, yarn is inserted by multiple needles into a synthetic backing, forming loops, which may be cut or left uncut, depending on the desired texture or construction. During 2021, Shaw processed approximately 97% of its requirements for carpet yarn in its own yarn processing facilities. The availability of raw materials is adequate, but costs are impacted by petro-chemical and natural gas price changes. Raw material cost changes are periodically factored into selling prices to customers.

The soft floor covering industry is highly competitive with only a handful of key players domestically where the majority of Shaw's business occurs. There are numerous manufacturers, domestically and internationally, that are engaged in hard surface floor covering production, distribution and sales. According to industry estimates, carpet accounts for approximately 44% of the total United States consumption of all flooring types. The principal competitive measures within the floor covering industry are quality, style, price and service.

Johns Manville

Johns Manville Corporation ("JM"), headquartered in Denver, Colorado, is a leading manufacturer and marketer of premium-quality products for building insulation, mechanical and industrial insulation, commercial roofing and roof insulation, as well as fibers and nonwovens for commercial, industrial and residential applications. JM serves markets that include aerospace, automotive and transportation, air handling, appliance, HVAC, pipe and equipment, filtration, waterproofing, building, flooring, interiors and wind energy. Fiberglass is the basic material in a majority of JM's products, although JM also manufactures a significant portion of its products with other materials to satisfy the broader needs of its customers. Raw materials are generally available in sufficient quantities from various sources for JM to maintain and expand its current production levels. JM regards its patents and licenses as valuable, however it does not consider any of its businesses to be materially dependent on any single patent or license. JM operates over 40 manufacturing facilities in North America and Europe and conducts research and development at its technical center in Littleton, Colorado and at other facilities in the U.S. and Europe.

Fiberglass is made from earthen raw materials and recycled glass, together with agents to bind many of its glass fibers. JM's products also contain materials other than fiberglass, including various chemical and petrochemical-based materials used in roofing and other specialized products. JM uses recycled material when available and suitable to satisfy the broader needs of its customers. The raw materials used in these various products are generally readily available in sufficient quantities from various sources to maintain and expand its current production levels.

JM identifies and strives to mitigate risk with respect to material applicable laws and regulations, including environmental laws and regulations. JM's operations are subject to a variety of federal, state and local environmental laws and regulations, which regulate or impose liability for the discharge of materials into the air, land and water and govern the use and disposal of hazardous substances and use of chemical substances. The most relevant of the federal laws are the Federal Clean Air Act, the Clean Water Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act and the Comprehensive Environmental Response, Compensation and Liability Act, which are administered by the EPA. Canadian and European regulatory authorities have also adopted their own environmental laws and regulations. JM continually monitors new and pending regulations and assesses their potential impact on the business. JM's capital projects regularly address environmental compliance and are generally incidental to other capital projects.

JM sells its products through a wide variety of channels including contractors, distributors, retailers, manufacturers and fabricators. JM operates in highly competitive markets, with competitors comprising primarily several large global and national manufacturers and smaller regional manufacturers. JM holds leadership positions in the key markets that it serves. JM's products compete primarily on value, differentiation and customization, and breadth of product line. Sales of JM's products are moderately seasonal due to increases in construction activity that typically occur in the second and third quarters of the calendar year. JM sees a marketplace trend in customer purchasing decisions being influenced by the sustainable and energy efficient attributes of its products, services and operations.

MiTek

MiTek Industries, Inc. ("MiTek"), based in Chesterfield, Missouri, operates in two separate markets: residential and commercial. MiTek operates worldwide with sales in over 100 countries and with manufacturing facilities and/or sales/engineering offices located in 21 countries.

In the residential building market, MiTek is a leading supplier of engineered connector products, construction hardware, engineering software and services and computer-driven manufacturing machinery to the truss component market of the building components industry. MiTek's primary customers are component manufacturers who manufacture prefabricated roof and floor trusses and wall panels for the residential building market. MiTek also sells construction hardware to commercial distributors and do-it-yourself retail stores.

A significant raw material used by MiTek is hot dipped galvanized sheet steel. While supplies are presently adequate, variations in supply have historically occurred, producing significant variations in cost and availability.

Benjamin Moore

Benjamin Moore & Co. ("Benjamin Moore"), headquartered in Montvale, New Jersey, is one of North America's leading manufacturers of premium quality residential, commercial and industrial maintenance coatings. Benjamin Moore is committed to innovation and sustainable manufacturing practices. The Benjamin Moore premium portfolio spans the brand's flagship paint lines including Aura®, Regal® Select, Ultra Spec®, ben®, ADVANCE®, ARBORCOAT® and more. The Benjamin Moore diversified brands include specialty and architectural paints from Coronado®, Insl-x® and Lenmar®. Benjamin Moore coatings are available from its more than 7,500 independently owned and operated paint, decorating and hardware retailers throughout the United States and Canada as well as 75 countries globally. In July 2019, Benjamin Moore announced the expansion of its relationship with Ace Hardware ("Ace"), through which Benjamin Moore has become the preferred paint supplier for approximately 3,800 Ace stores, which are included in the count above. Through this agreement, these Ace stores are afforded the opportunity to carry a full line premium assortment of Benjamin Moore products or a streamlined offering of Regal® Select and ben®, or ben® only branded products. As part of the expansion, Benjamin Moore assumed responsibility for manufacturing Clark+Kensington® and Royal®, as well as the balance of Ace's private label paint brands.

In addition, Benjamin Moore operates an online "pick up in store" program, which allows consumers to place orders via an e-commerce site or, for national accounts and government agencies, via its customer information center. These orders may be picked up at the customer's nearest retailer or delivered. For national accounts, drop-ship orders can be fulfilled by Benjamin Moore if a minimum gallon threshold is met.

Benjamin Moore competes with numerous manufacturers, distributors and paint, coatings and related products retailers. Product quality, product innovation, breadth of product line, technical expertise, service and price determine the competitive advantage. Competitors include other paint and decorating stores, mass merchandisers, home centers, independent hardware stores, hardware chains and manufacturer-operated direct outlets, such as Sherwin-Williams Company, PPG Industries, Inc., The Valspar Corporation, The Home Depot, Inc. and Lowe's Companies, Inc.

The most significant raw materials in Benjamin Moore products are titanium dioxide, monomers, polymers and pigments. Historically, these materials have been generally available, with pricing and availability subject to fluctuation. In 2021, raw material supply constraints and increased customer demand for products prevailed and disrupted Benjamin Moore's ability to build inventory. A major winter storm that impacted the Gulf Coast region of the United States in February of 2021 caused substantial supply chain disruptions for Benjamin Moore, which contributed to significant inflation in manufacturing costs.

Benjamin Moore undertakes to comply with applicable regulations relating to protection of the environment and workers' safety and products meet or exceed environmental standards. Benjamin Moore has certain known past environmental matters, which are subject to on-going monitoring and/or remediation efforts.

Acme

Acme Brick Company ("Acme"), headquartered in Fort Worth, Texas, manufactures and distributes clay bricks (Acme Brick®) and concrete block (Featherlite). In addition, Acme distributes numerous other building products of other manufacturers, including floor and wall tile, wood flooring and other masonry products. Products are sold primarily in the South Central and Southeastern United States through company-operated sales offices. Acme distributes products primarily to homebuilders and masonry and general contractors.

Over the past three years, Acme closed multiple manufacturing and sales facilities. Acme operates 12 clay brick manufacturing sites located in four states, three concrete block facilities and a quarrying operation all located in Texas. The demand for Acme's products is seasonal, with higher sales in the warmer weather months, and is subject to the level of construction activity, which is cyclical. Acme also owns and leases properties and mineral rights that supply raw materials used in many of its manufactured products. Acme's raw materials supply is believed to be adequate.

The brick industry is subject to the EPA Maximum Achievable Control Technology Standards ("MACT"). As required under the 1990 Clean Air Act, the EPA developed a list of source categories that require the development of National Emission Standards for Hazardous Air Pollutants, which are also referred to as MACT Standards ("Rule"). Key elements of the MACT Rule include emission limits established for certain hazardous air pollutants and acidic gases. Acme's brick plants are in compliance with the current Rule.

Consumer Products

Apparel

Fruit of the Loom Inc. ("FOL"), headquartered in Bowling Green, Kentucky, is primarily a manufacturer and distributor of basic apparel, underwear, casualwear, athletic apparel and sports equipment. Products under the Fruit of the Loom® and JERZEES® labels are primarily sold in the mass merchandise, mid-tier chains and wholesale markets. In the Vanity Fair Brands product line, Vassarette®, Curvation® and Radiant® by Vanity Fair are sold in the mass merchandise market, while Vanity Fair® and Lily of France® products are sold to mid-tier chains and department stores. FOL also markets and sells apparel, sports equipment and balls to team dealers and athletic apparel, sports equipment and balls to sporting goods retailers under the Russell Athletic® and Spalding® brands. Additionally, Spalding® markets and sells balls and sports equipment in the mass merchandise market and dollar store channels. In 2021, a significant portion of FOL's sales were to Walmart Inc.("Walmart").

FOL generally performs its own knitting, cloth finishing, cutting, sewing and packaging for apparel. For the North American market, which is FOL's predominant sales region, cloth manufacturing is primarily performed in Honduras. Labor-intensive cutting, sewing and packaging operations are in Central America, the Caribbean and Vietnam. For the European market, products are either sourced from third-party contractors in Europe or Asia or sewn in Morocco from textiles internally produced in Morocco. Bras, athletic equipment, sporting goods and other athletic apparel lines are generally sourced from third-party contractors located primarily in Asia.

U.S.-grown cotton fiber and U.S.-manufactured polyester fiber are the main raw materials used in manufacturing FOL's products. Historically, fibers have been purchased from a limited number of third parties. In 2015, FOL entered into an agreement with one key supplier to provide the majority of its yarn spinning/raw material conversion services. As a result, yarn production was primarily with one supplier. Supply chain issues related to the COVID pandemic including labor shortage at suppliers, yarn shortages, and price inflation in raw materials and freight resulted in FOL utilizing alternative sources of raw materials and yarn in 2021. Further, FOL has contracted with an additional supplier for a significant portion of FOL's yarn spinning/raw material conversion services that is scheduled to begin in July 2022. If relationships with suppliers cannot be maintained or delays occur in obtaining alternative sources of supply, production and operating results can be adversely affected. FOL's markets are highly competitive, consisting of many domestic and foreign manufacturers and distributors. Competition is generally based upon product features, quality, customer service and price.

Garan Incorporated ("Garan"), headquartered in New York, New York designs, manufactures, imports and sells apparel primarily for children, including boys, girls, toddlers and infants. Products are sold under its own trademarks Garanimals® and 365 Kids from Garanimals®, as well as customer private label brands. Garan conducts its business through operating subsidiaries located in the United States, Central America and Asia. Garan's products are sold through its distribution centers in the United States. Fechheimer Brothers Company ("Fechheimers") manufactures and distributes uniforms, principally for the public service and safety markets, including police, fire, postal and military markets. Fechheimers is based in Cincinnati, Ohio.

The BH Shoe Holdings Group, headquartered in Greenwich, Connecticut, manufactures and distributes work, rugged outdoor and casual shoes and western-style footwear under a number of brand names, including Justin, Tony Lama®, Chippewa®, BØRN®, B•Ø•C®, Carolina®, EuroSofft, Söfft, Double-H Boots®, Nursemates® and Comfortiva®. Brooks Sports, Inc., headquartered in Seattle, Washington, markets and sells performance running footwear and apparel to specialty and national retailers and directly to consumers under the Brooks® brand. A significant volume of the shoes sold by Berkshire's shoe businesses are manufactured or purchased from sources located outside the United States. Products are sold worldwide through a variety of channels including department stores, footwear chains, specialty stores, catalogs and the Internet, as well as through company-owned retail stores.

Other consumer products

Forest River, Inc. ("Forest River") is a manufacturer of recreational vehicles ("RV"), utility cargo trailers, buses and pontoon boats, headquartered in Elkhart, Indiana with products sold in the United States and Canada through an independent dealer network. Forest River has numerous manufacturing facilities located in six states and is a leading manufacturer of RVs with numerous brand names, including Forest River, Coachmen RV and Prime Time. Utility cargo trailers are sold under a variety of brand names. Buses are sold under several brand names, including Starcraft Bus. Pontoon boats are sold under the Berkshire, South Bay and Trifecta brand names. The RV industry is very competitive. Competition is based primarily on price, design, quality and service. The industry has consolidated over the past several years and is currently concentrated in a few companies, the largest of which had a market share of approximately 41% based on industry data as of December 2021. Forest River held a market share of approximately 36% at that time.

Forest River is subject to regulations of the National Traffic and Motor Vehicle Safety Act, the safety standards for recreational vehicles established by the U.S. Department of Transportation and similar laws and regulations issued by the Canadian government. Forest River is a member of the Recreational Vehicle Industry Association, a voluntary association of recreational vehicle manufacturers which promotes safety standards for recreational vehicles. Forest River believes its products comply in all material respects to the standards that govern its products.

The Duracell Company ("Duracell"), headquartered in Chicago, Illinois, is a leading manufacturer of high-performance alkaline batteries. Duracell manufactures batteries in the U.S., Europe and China and provides a network of worldwide sales and distribution centers. Costco and Walmart are significant customers, representing approximately 30% of Duracell's annual revenue. There are several competitors in the battery manufacturing market with Duracell holding an approximately 29% market share of the global alkaline battery market. Management believes there are currently sufficient sources of raw materials available, which are primarily steel, zinc, manganese and nickel-based chemistries.

Albecca Inc. ("Albecca"), headquartered in Suwanee, Georgia, operates in the U.S., Canada and 12 other countries, with products primarily under the Larson-Juhl® name. Albecca designs, manufactures and distributes a complete line of high quality, branded custom framing products, including wood and metal moulding, matboard, foamboard, glass and framing supplies. Complementary to its framing products, Albecca offers art printing and fulfillment services.

Richline Group, Inc., headquartered in New York, New York, operates five strategic business units: Richline Jewelry, Richline Digital, LeachGarner, Rio Grande and Inverness. Each business unit is a manufacturer and/or distributor of precious metal, non-precious metal, diamond and gem products to specific target markets including large jewelry chains, department stores, shopping networks, mass merchandisers, e-commerce retailers and artisans plus worldwide manufacturers and wholesalers and the medical, electronics and aerospace industries.

Service and Retailing Businesses

Service Businesses

Berkshire's service businesses provide grocery and foodservice distribution, professional aviation training programs, shared aircraft ownership programs and distribution of electronic components. Other service businesses include franchising and servicing of quick service restaurants, media businesses (television and information distribution), as well as logistics businesses. Berkshire's service businesses employed approximately 48,500 people at the end of 2021. Information concerning these activities follows.

McLane

McLane Company, Inc. ("McLane") provides wholesale distribution services in all 50 states to customers that include convenience stores, discount retailers, wholesale clubs, drug stores, military bases, quick service restaurants and casual dining restaurants. McLane provides wholesale distribution services to Walmart, which accounted for approximately 16.5% of McLane's revenues in 2021. McLane's other significant customers include 7-Eleven (approximately 13.9% of revenues) and Yum! Brands, (approximately 11.5% of revenues). McLane's business model is based on a high volume of sales, rapid inventory turnover and stringent expense controls. Operations are currently divided into three business units: grocery distribution, foodservice distribution and beverage distribution.

McLane's grocery distribution unit, based in Temple, Texas, maintains a dominant market share within the convenience store industry and serves most of the national convenience store chains and major oil company retail outlets. Grocery operations provide products to approximately 48,600 retail locations nationwide, including Walmart. McLane's grocery distribution unit operates 25 distribution facilities in 20 states.

McLane's foodservice distribution unit, based in Carrollton, Texas, focuses on serving the quick service and casual dining restaurant industry with high quality, timely-delivered products. Operations are conducted through 47 facilities in 22 states. The foodservice distribution unit services approximately 34,000 restaurants nationwide.

Through its subsidiaries, McLane also operates wholesale distributors of distilled spirits, wine and beer. The beverage unit operates as Empire Distributors and operations are conducted through 14 distribution centers in Georgia, North Carolina, Tennessee and Colorado. Empire Distributors services approximately 26,500 retail locations in the southeastern United States and Colorado.

FlightSafety

FlightSafety International Inc. (“FlightSafety”) is an industry leading provider of professional aviation training services and flight simulation products. FlightSafety and FlightSafety Textron Aviation Training, a joint venture with Textron which began operations in 2019, provide high technology training to pilots, aircraft maintenance technicians, flight attendants and dispatchers who operate and support a wide variety of business, commercial and military aircraft. The training is provided using a large fleet of advanced full flight simulators at learning centers and training locations in the United States, Australia, Brazil, Canada, France, Japan, Norway, South Africa and the United Kingdom. Compliance with applicable environmental regulations is an inherent requirement to operate the facilities. The vast majority of the instructors, training programs and flight simulators are qualified by the United States Federal Aviation Administration (“FAA”) and other aviation regulatory agencies around the world.

FlightSafety is also a leader in the design and manufacture of full flight simulators, visual systems, displays and other advanced technology training devices. This equipment is used to support FlightSafety training programs and is offered for sale to airlines and government and military organizations around the world. Manufacturing facilities are located in Oklahoma, Missouri and Texas. FlightSafety strives to maintain and manufacture simulators and develop courseware using state-of-the-art technology and invests in research and development as it builds new equipment and training programs.

NetJets

NetJets Inc. (“NetJets”) is the world’s leading provider of shared ownership programs for general aviation aircraft. NetJets’ global headquarters is located in Columbus, Ohio, with most of its logistical and flight operations based at John Glenn Columbus International Airport. NetJets’ European operations are based in Lisbon, Portugal. The shared ownership concept is designed to meet the travel needs of customers who require the scale, flexibility and access of a large fleet that whole aircraft ownership cannot deliver. In addition, shared ownership programs are available for corporate flight departments seeking to outsource their general aviation needs or add capacity for peak periods and for others that previously chartered aircraft.

With a focus on safety and service, NetJets’ programs are designed to offer customers guaranteed availability of aircraft, predictable operating costs and increased liquidity. NetJets’ shared aircraft ownership programs permit customers to acquire a specific percentage of a certain aircraft type and allows customers to utilize the aircraft for a specified number of flight hours annually. In addition, NetJets offers prepaid flight cards and other aviation solutions and services for aircraft management, customized aircraft sales and acquisition, ground support and flight operation services under a number of programs including NetJets Shares™, NetJets Leases™ and the NetJets Card Program™.

NetJets is subject to the rules and regulations of the FAA, the Portuguese Civil Aviation Authority and the European Union Aviation Safety Agency. Regulations address aircraft registration, maintenance requirements, pilot qualifications and airport operations, including flight planning and scheduling as well as security issues and other matters. NetJets maintains a comprehensive training and development program in compliance with regulatory requirements for pilots, flight attendants, maintenance mechanics, and other flight operations specialists.

TTI

TTI, Inc. (“TTI”), headquartered in Fort Worth, Texas, is a global specialty distributor of passive, interconnect, electromechanical, discrete, and semiconductor components used by customers in the manufacturing and assembling of electronic products. TTI’s customer base includes original equipment manufacturers, electronic manufacturing services, original design manufacturers and military and commercial customers, as well as design and system engineers. TTI’s distribution agreements with the industry’s leading suppliers allow it to uniquely leverage its product cost and to expand its business by providing new lines and products to its customers. TTI operates sales offices and distribution centers from more than 100 locations throughout North America, South America, Europe, Asia and Israel.

TTI services a variety of industries including telecommunications, medical devices, computers and office equipment, military/aerospace, automotive and industrial electronics. TTI’s core customers include businesses in the design through production stages in the electronic component supply chain, which supports its high-volume business, and its Mouser subsidiary, which supports a broader base of customers with lower volume purchases through internet-based marketing.

Other services

XTRA Corporation ("XTRA"), headquartered in St. Louis, Missouri, is a leading transportation equipment lessor operating under the XTRA Lease® brand name. XTRA manages a diverse fleet of approximately 87,000 units located at 47 facilities throughout the United States. The fleet includes over-the-road and storage trailers, chassis, temperature-controlled vans and flatbed trailers. XTRA is one of the largest lessors (in terms of units available) of over-the-road trailers in North America. Transportation equipment customers lease equipment to cover cyclical, seasonal and geographic needs and as a substitute for purchasing equipment. Therefore, as a provider of marginal capacity to its customers, XTRA's utilization rates and operating results tend to be cyclical. In addition, transportation providers often use leasing to maximize their asset utilization and reduce capital expenditures. By maintaining a large fleet, XTRA is able to provide customers with a broad selection of equipment and quick response times.

International Dairy Queen Inc. develops and services a worldwide system of over 7,000 franchised restaurants operating primarily under the names DQ Grill and Chill®, Dairy Queen® and Orange Julius® that offer various dairy desserts, beverages, prepared foods and blended fruit drinks. Business Wire Inc. ("Business Wire") transmits full-text news releases, regulatory filings, photos and other multimedia content to journalists, financial professionals, investor services, regulatory authorities and the general public. Releases are distributed globally via Business Wire's patented NX network. CORT Business Services Corporation ("CORT") is a leading national provider of rental furniture and related services in the "rent-to-rent" segment of the furniture rental industry. CORT's primary revenue streams include furniture rental to individuals, businesses, government agencies, the trade show and events industry and retail sales of new and used furniture. WPLG, Inc. is an ABC affiliate broadcast station in Miami, Florida and Charter Brokerage Holdings Corp. is a leading non-asset based third party logistics provider to the petroleum and chemical industries. Until March 2020, other services included the newspaper publishing businesses conducted through The Buffalo News and BH Media Group, Inc. These operations were sold in 2020.

Retailing Businesses

Berkshire's retailing businesses include automotive, home furnishings and several other operations that sell various consumer products. Berkshire's retailing businesses employed approximately 26,000 people at the end of 2021. Information regarding each of these operations follows.

Berkshire Hathaway Automotive

Berkshire Hathaway Automotive, Inc. ("BHA") and its affiliates is one of the largest automotive retailers in the United States, currently operating 105 new vehicle franchises through 82 dealerships located primarily in major metropolitan markets in the United States. The dealerships sell new and used vehicles, vehicle maintenance and repair services, extended service contracts, vehicle protection products and other aftermarket products. BHA also arranges financing for its customers through third-party lenders. BHA operates 28 collision centers directly connected to the dealerships' operations and owns and operates two auto auctions and a fluid maintenance products distribution company.

Dealership operations are highly concentrated in the Arizona and Texas markets, with approximately 75% of dealership-related revenues derived from sales in these markets. BHA currently maintains franchise agreements with 27 different vehicle manufacturers, although it derives a significant portion of its revenue from the Toyota/Lexus, General Motors, Ford/Lincoln, Nissan/Infiniti and Honda/Acura brands. Approximately 90% of BHA's annual revenues are from dealerships representing these manufacturers.

The retail automotive industry is highly competitive. BHA faces competition from other large public and private dealership groups, as well as individual franchised dealerships and competition via the Internet. Given the pricing transparency available via the Internet, and the fact that franchised dealers acquire vehicles from the manufacturers on the same terms irrespective of volume, the location and quality of the dealership facility, customer service and transaction speed are key differentiators in attracting customers.

BHA's overall relationships with the automobile manufacturers are governed by framework agreements. The framework agreements contain provisions relating to the management, operation, acquisition and ownership structure of BHA's dealerships. Failure to meet the terms of these agreements could adversely impact BHA's ability to acquire additional dealerships representing those manufacturers. Additionally, these agreements contain limitations on the number of dealerships from a specific manufacturer that may be owned by BHA.

Individual dealerships operate under franchise agreements with the manufacturer, which grants the dealership entity a non-exclusive right to sell the manufacturer's brand of vehicles and offer related parts and service within a specified market area, as well as the right to use the manufacturer's trademarks. The agreements contain various requirements and restrictions related to the management and operation of the franchised dealership and provide for termination of the agreement by the manufacturer or non-renewal for a variety of causes. States generally have automotive dealership franchise laws that provide substantial protection to the franchisee, and it is difficult for a manufacturer to terminate or not renew a franchise agreement outside of bankruptcy or with "good cause" under the applicable state franchise law.

BHA also develops, underwrites and administers various vehicle protection plans as well as life and accident and health insurance plans sold to consumers through BHA's dealerships and third-party dealerships. BHA also develops proprietary training programs and materials and provides ongoing monitoring and training of the dealership's finance and insurance personnel.

<u>Home furnishings retailing</u>

The home furnishings businesses consist of Nebraska Furniture Mart Inc. ("NFM"), R.C. Willey Home Furnishings ("R.C. Willey"), Star Furniture Company ("Star") and Jordan's Furniture, Inc. ("Jordan's"). These businesses offer a wide selection of furniture, bedding and accessories. In addition, NFM and R.C. Willey sell a full line of major household appliances, electronics, computers and other home furnishings and offer customer financing to complement their retail operations. An important feature of each of these businesses is their ability to control costs and to produce high business volume by offering significant value to their customers.

NFM operates its business from four retail complexes with almost 4.5 million square feet of retail, warehouse and administrative facilities located in Omaha, Nebraska, Clive, Iowa, Kansas City, Kansas and The Colony, Texas. NFM also owns Homemakers Furniture located in Urbandale, Iowa, which has approximately 600,000 square feet of retail, warehouse and administrative space. NFM is the largest furniture retailer in each of these markets. R.C. Willey, based in Salt Lake City, Utah, currently operates eleven full-line retail home furnishings stores and three distribution centers. These facilities include approximately 1.5 million square feet of retail space with five stores located in Utah, one store in Meridian, Idaho, three stores in Nevada (Las Vegas and Reno) and two stores in the Sacramento, California area.

Jordan's operates a retail furniture business from seven locations with approximately 890,000 square feet of retail space in stores located in Massachusetts, New Hampshire, Rhode Island, Maine and Connecticut. The retail stores are supported by an 800,000 square foot distribution center in Taunton, Massachusetts. Jordan's is the largest furniture retailer, as measured by sales, in Massachusetts, Maine and New Hampshire. Jordan's is well known in its markets for its unique store arrangements and advertising campaigns. Star has operated home furnishings retail stores in Texas for many years. Star's retail facilities currently include about 700,000 square feet of retail space in 10 locations in Texas, including seven in Houston.

<u>Other retailing</u>

Borsheim Jewelry Company, Inc. ("Borsheims") operates from a single store in Omaha, Nebraska. Borsheims is a high-volume retailer of fine jewelry, watches, crystal, china, stemware, flatware, gifts and collectibles. Helzberg's Diamond Shops, LLC. ("Helzberg") is based in North Kansas City, Missouri, and operates a chain of 173 retail jewelry stores in 34 states, which includes approximately 400,000 square feet of retail space. Helzberg's stores are located in malls, lifestyle centers, power strip centers and outlet malls, and all stores operate under the name Helzberg Diamonds® or Helzberg Diamonds Outlet®. The Ben Bridge Corporation ("Ben Bridge Jeweler"), based in Seattle, Washington, operates 74 retail jewelry stores under three different brand names, located primarily in major shopping malls in nine western states and in British Columbia, Canada. Thirty-five of its retail locations are upscale jewelry stores selling loose diamonds, finished jewelry and high-end timepieces. Thirty-eight of its retail locations are concept stores operating under a franchise agreement that sell only Pandora jewelry. One store is a Breitling concept store, selling only Breitling timepieces.

See's Candy Shops, Incorporated ("See's") produces boxed chocolates and other confectionery products with an emphasis on quality and distinctiveness in two large kitchens in Los Angeles and South San Francisco and a facility in Burlingame, California. See's operates approximately 250 retail and volume saving stores located mainly in California and other Western states, as well as over 125 seasonal locations. See's revenues are highly seasonal with approximately half of its annual revenues earned in the fourth quarter.

The Pampered Chef, Ltd. ("Pampered Chef") is a premier direct seller of distinctive high-quality kitchenware products with sales and operations in the United States, Canada, Germany, Austria and France and operations in China. Pampered Chef's product portfolio consists of approximately 420 Pampered Chef® branded kitchenware items in categories ranging from stoneware and cutlery to grilling and entertaining. Pampered Chef's products are available through its sales force of independent cooking consultants and online.

Oriental Trading Company ("OTC") is a leading multi-channel retailer and online destination for fun-value-priced party supplies, seasonal products, arts and crafts, toys and novelties, school supplies, educational games and patient giveaways. OTC, headquartered in Omaha, Nebraska, serves a broad base of nearly four million customers annually, including consumers, schools, churches, non-profit organizations, medical and dental offices, online marketplaces and other businesses. OTC offers a unique assortment of over 80,000 fun products emphasizing proprietary designs. OTC operates both direct-to-consumer and business-to-business brands including Oriental Trading®, Fun Express®, MindWare®, SmileMakers®, Morris Costumes® and HalloweenExpress.com® and utilizes digital and print marketing along with dedicated sales teams to drive traffic and industry-leading customer satisfaction.

Detlev Louis Motorrad ("Louis"), headquartered in Hamburg, Germany, is a leading retailer of motorcycle apparel and equipment in Europe. Louis carries over 32,000 different products from more than 600 manufacturers, primarily covering the clothing, technical equipment and leisure markets. Louis has over 80 stores in Germany, Austria, Switzerland and the Netherlands and also sells via the Internet throughout most of Europe.

Additional information with respect to Berkshire's businesses

Revenue, earnings before taxes and identifiable assets attributable to Berkshire's reportable business segments are included in Note 25 to Berkshire's Consolidated Financial Statements contained in Item 8, Financial Statements and Supplementary Data. Additional information regarding Berkshire's investments in fixed maturity and equity securities is included in Notes 3 and 4, respectively, to Berkshire's Consolidated Financial Statements.

Berkshire owns 26.6% of the outstanding common stock of The Kraft Heinz Company ("Kraft Heinz"). Kraft Heinz is one of the largest food and beverage companies in the world, with sales in numerous countries within developed and emerging markets and territories. Kraft Heinz manufactures and markets food and beverage products, including condiments and sauces, cheese and dairy meals, meats, refreshment beverages, coffee and other grocery products, throughout the world, under a diverse mix of iconic and emerging brands. Berkshire subsidiaries also own a 50% joint venture interest in Berkadia Commercial Mortgage LLC, a 38.6% interest in Pilot Travel Centers LLC, a 50% joint venture interest in Electric Transmission Texas, LLC and a 50% noncontrolling interest in Iroquois Gas Transmission System L.P. Information concerning these investments is included in Note 5 to Berkshire's Consolidated Financial Statements.

Berkshire maintains a website (http://www.berkshirehathaway.com) where its annual reports, certain corporate governance documents, press releases, interim shareholder reports and links to its subsidiaries' websites can be found. Berkshire's periodic reports filed with the SEC, which include Form 10-K, Form 10-Q, Form 8-K and amendments thereto, may be accessed by the public free of charge from the SEC and through Berkshire. Electronic copies of these reports can be accessed at the SEC's website (http://www.sec.gov) and indirectly through Berkshire's website (http://www.berkshirehathaway.com). Copies of these reports may also be obtained, free of charge, upon written request to: Berkshire Hathaway Inc., 3555 Farnam Street, Omaha, NE 68131, Attn: Corporate Secretary.

Item 1A. Risk Factors

Berkshire and its subsidiaries (referred to herein as “we,” “us,” “our” or similar expressions) are subject to certain risks and uncertainties in its business operations which are described below. The risks and uncertainties described below are not the only risks we face. Additional risks and uncertainties that are presently unknown or are currently deemed immaterial may also impair our business operations.

General Business Risks

Terrorist acts could hurt our operating businesses.

A cyber, biological, nuclear or chemical attack could produce significant losses to our worldwide operations. Our business operations could be adversely affected from such acts through the loss of human resources or destruction of production facilities and information systems. We share the risk with all businesses.

Cyber security risks

We rely on technology in virtually all aspects of our business. Like those of many large businesses, certain of our information systems have been subject to computer viruses, malicious codes, unauthorized access, phishing efforts, denial-of-service attacks and other cyber-attacks and we expect to be subject to similar attacks in the future as such attacks become more sophisticated and frequent. A significant disruption or failure of our technology systems could result in service interruptions, safety failures, security events, regulatory compliance failures, an inability to protect information and assets against unauthorized users and other operational difficulties. Attacks perpetrated against our systems could result in loss of assets and critical information and expose us to remediation costs and reputational damage.

Although we have taken steps intended to mitigate these risks, including business continuity planning, disaster recovery planning and business impact analysis, a significant disruption or cyber intrusion at one or more of our significant operations could adversely affect our results of operations, financial condition and liquidity. Additionally, if we are unable to acquire, develop, implement, adopt or protect rights around new technology, we may suffer a competitive disadvantage, which could also have an adverse effect on our results of operations, financial condition and/or liquidity.

Cyber-attacks could further adversely affect our ability to operate facilities, information technology and business systems or compromise confidential customer and employee information. Political, economic, social or financial market instability or damage to or interference with our operating assets, customers or suppliers from cyber-attacks may result in business interruptions, lost revenues, higher commodity prices, disruption in fuel supplies, lower energy consumption, unstable markets, increased security, repair or other costs, or may materially adversely affect us in ways that cannot be predicted at this time. Any of these risks could materially affect our consolidated financial results. Furthermore, instability in the financial markets resulting from terrorism, sustained or significant cyber-attacks or war could also have a material adverse effect on our ability to raise capital. We share these risks with all businesses.

We are dependent on a few key people for our major investment and capital allocation decisions.

Major investment decisions and all major capital allocation decisions are made by Warren E. Buffett, Chairman of the Board of Directors and Chief Executive Officer, age 91, in consultation with Charles T. Munger, Vice Chairman of the Board of Directors, age 98. In 2018, Berkshire’s Board of Directors appointed Mr. Gregory Abel as Vice Chairman of Berkshire’s non-insurance operations and Mr. Ajit Jain as Vice Chairman of Berkshire’s insurance operations. Mr. Abel and Mr. Jain each report directly to Mr. Buffett. Mr. Buffett continues to be responsible for major capital allocation and investment decisions.

If for any reason the services of our key personnel, particularly Mr. Buffett, were to become unavailable, there could be a material adverse effect on our operations. Should a replacement for Mr. Buffett be needed currently, Berkshire’s Board of Directors has agreed that Mr. Abel should replace Mr. Buffett. The Board continually monitors this risk and could alter its current view regarding a replacement for Mr. Buffett in the future. We believe that the Board’s succession plan, together with the outstanding managers running our numerous and highly diversified operating units helps to mitigate this risk.

We need qualified personnel to manage and operate our various businesses.

In our decentralized business model, we need qualified and competent management to direct day-to-day business activities of our operating subsidiaries and to manage changes in future business operations due to changing business or regulatory environments. Our operating subsidiaries also need qualified and competent personnel in executing their business plans and serving their customers, suppliers and other stakeholders. Our inability to recruit and retain qualified and competent managers and personnel could negatively affect the operating results, financial condition and liquidity of our subsidiaries and Berkshire as a whole.

Investments are unusually concentrated in equity securities and fair values are subject to loss in value.

We concentrate a high percentage of the equity security investments of our insurance subsidiaries in a relatively small number of equity securities. A significant decline in the fair values of our larger investments in equity securities may produce a material decline in our consolidated shareholders' equity and our consolidated earnings.

Since a large percentage of our equity securities are held by our insurance subsidiaries, significant decreases in the fair values of these investments will produce significant declines in the statutory surplus of our insurance business. Our large statutory surplus is a competitive advantage, and a long-term material decline could have an adverse effect on our claims-paying ability ratings and our ability to write new insurance business thus potentially reducing our future underwriting profits.

Competition and technology may erode our business franchises and result in lower earnings.

Each of our operating businesses face intense competition within markets in which they operate. While we manage our businesses with the objective of achieving long-term sustainable growth by developing and strengthening competitive advantages, many factors, including technological changes, may erode or prevent the strengthening of competitive advantages. Accordingly, our future operating results will depend to some degree on our operating units successfully protecting and enhancing their competitive advantages. If our operating businesses are unsuccessful in these efforts, our periodic operating results in the future may decline.

Unfavorable general economic conditions may significantly reduce our operating earnings and impair our ability to access capital markets at a reasonable cost.

Our operating businesses are subject to normal economic cycles affecting the general economy or the specific industries in which they operate. Significant deteriorations of economic conditions over a prolonged period could produce a material adverse effect on one or more of our significant operations. In addition, our utilities and energy businesses and our railroad business regularly utilize debt as a component of their capital structures and depend on having access to borrowed funds through the capital markets at reasonable rates. To the extent that access to the capital markets is restricted or the cost of funding increases, these operations could be adversely affected.

Epidemics, pandemics or other outbreaks, including COVID-19, could hurt our operating businesses.

The outbreak of COVID-19 has adversely affected, and in the future it or other epidemics, pandemics or outbreaks may adversely affect, our operations, including our equity securities portfolio. This is or may be due to closures or restrictions requested or mandated by governmental authorities, disruption to supply chains and workforce, reduction of demand for our products and services, credit losses when customers and other counterparties fail to satisfy their obligations to us, and volatility in global equity securities markets, among other factors. We share most of these risks with all businesses.

Regulatory changes may adversely impact our future operating results.

Over time, in response to financial markets crises, global economic recessions, and social and environmental issues, regulatory initiatives were adopted in the United States and elsewhere. Such initiatives addressed for example, the regulation of banks and other major financial institutions, products and environmental and global-warming matters. These initiatives impact all of our businesses, albeit in varying ways. Increased regulatory compliance costs could have a significant negative impact on our operating businesses, as well as on the businesses in which we have a significant, but not controlling economic interests. We cannot predict whether such initiatives will have a material adverse impact on our consolidated financial position, results of operations and/or cash flows.

Data privacy regulations have recently been enacted in various jurisdictions in the U.S. and throughout the world. These regulations address numerous aspects related to the security of personal information that is stored in our information systems, networks and facilities. Failure to comply with these regulations could result in reputational damage and significant penalties.

Risks unique to our regulated businesses

Our tolerance for risk in our insurance businesses may result in significant underwriting losses.

When properly paid for the risk assumed, we have been and will continue to be willing to assume more risk from a single event than any other insurer has knowingly assumed. Accordingly, we could incur a significant loss from a single catastrophe event resulting from a natural disaster or man-made catastrophes such as terrorism or cyber-attacks. We employ various disciplined underwriting practices intended to mitigate potential losses and attempt to take into account all possible correlations and avoid writing groups of policies from which pre-tax losses from a single catastrophe event might aggregate above $10 billion. However, despite our efforts, it is possible that losses could manifest in ways that we do not anticipate and that our risk mitigation strategies are not designed to address. Additionally, various provisions of our policies, such as limitations or exclusions from coverage, negotiated to limit our risks, may not be enforceable in the manner we intend. Our tolerance for significant insurance losses may result in lower reported earnings in a future period.

The degree of estimation error inherent in the process of estimating property and casualty insurance loss reserves may result in significant underwriting losses.

The principal cost associated with the property and casualty insurance business is claims. In writing property and casualty insurance policies, we receive premiums today and promise to pay covered losses in the future. However, it will take decades before all claims that have occurred as of any given balance sheet date will be reported and settled. Although we believe that liabilities for unpaid losses are adequate, we will not know whether these liabilities or the premiums charged for the coverages provided were sufficient until well after the balance sheet date. Estimating insurance claim costs is inherently imprecise. Our estimated unpaid losses arising under contracts covering property and casualty insurance risks are large ($125 billion at December 31, 2021), and a small percentage increase to those liabilities can result in materially lower reported earnings.

Climate change may impact our businesses.

Climate change could cause increases in hurricanes, floods, wildfires, and other risks that could produce losses affecting our businesses. Also, failure to comply with new or existing regulations or reinterpretations of existing regulations relating to climate change could have a significant adverse effect on our financial results.

Changes in regulations and regulatory actions can adversely affect our operating results and our ability to allocate capital.

Our insurance businesses are subject to regulation in the jurisdictions in which we operate. Such regulations may relate to among other things, the types of business that can be written, the rates that can be charged for coverage, the level of capital that must be maintained, and restrictions on the types and size of investments that can be made. Regulations may also restrict the timing and amount of dividend payments to Berkshire by these businesses. U.S. state insurance regulators and international insurance regulators are also actively developing various regulatory mechanisms to address the regulation of large internationally active insurance groups, including regulations concerning group capital, liquidity, governance and risk management. Accordingly, changes in regulations related to these or other matters or regulatory actions imposing restrictions on our insurance businesses may adversely impact our results of operations and restrict our ability to allocate capital.

Our railroad business conducted through BNSF is also subject to a significant number of laws and regulations with respect to rates and practices, taxes, railroad operations and a variety of health, safety, labor, environmental and other matters. Failure to comply with applicable laws and regulations could have a material adverse effect on BNSF's business. Governments may change the legislative and/or regulatory framework within which BNSF operates, without providing any recourse for any adverse effects that the change may have on the business. Complying with legislative and regulatory changes may pose significant operating and implementation risks and require significant capital expenditures.

BNSF derives significant amounts of revenue from the transportation of energy-related commodities, particularly coal. To the extent that changes in government policies limit or restrict the usage of coal as a source of fuel in generating electricity or alternate fuels, such as natural gas, or displace coal on a competitive basis, revenues and earnings could be adversely affected. As a common carrier, BNSF is also required to transport toxic inhalation hazard chemicals and other hazardous materials. A release of hazardous materials could expose BNSF to significant claims, losses, penalties and environmental remediation obligations. Changes in the regulation of the rail industry could negatively impact BNSF's ability to determine prices for rail services and to make capital improvements to its rail network, resulting in an adverse effect on our results of operations, financial condition and/or liquidity.

Our utilities and energy businesses operated under BHE are highly regulated by numerous federal, state, local and foreign governmental authorities in the jurisdictions in which they operate. These laws and regulations are complex, dynamic and subject to new interpretations or change. Regulations affect almost every aspect of our utilities and energy businesses. Regulations broadly apply and may limit management's ability to independently make and implement decisions regarding numerous matters including: acquiring businesses; constructing, acquiring, disposing or retiring of operating assets; operating and maintaining generating facilities and transmission and distribution system assets; complying with pipeline safety and integrity and environmental requirements; setting rates charged to customers; establishing capital structures and issuing debt; managing and reporting transactions between our domestic utilities and our other subsidiaries and affiliates; and paying dividends or similar distributions. Failure to comply with or reinterpretations of existing regulations and new legislation or regulations, such as those relating to air and water quality, renewable portfolio standards, emissions performance standards, climate change, coal combustion byproduct disposal, hazardous and solid waste disposal, protected species and other environmental matters, or changes in the nature of the regulatory process may have a significant adverse impact on our financial results.

Our railroad business requires significant ongoing capital investment to improve and maintain its railroad network so that transportation services can be safely and reliably provided to customers on a timely basis. Our utilities and energy businesses also require significant amounts of capital to construct, operate and maintain generation, transmission and distribution systems to meet their customers' needs and reliability criteria. Additionally, system assets may need to be operational for long periods of time in order to justify the financial investment. The operational or financial failure of capital projects may not be recoverable through rates that are charged to customers. Further, a significant portion of costs of capital improvements may be funded through debt issued by BNSF and BHE and their subsidiaries. Disruptions in debt capital markets that restrict access to funding when needed could adversely affect the results of operations, liquidity and/or capital resources of these businesses.

Item 1B. Unresolved Staff Comments

None.

Item 2. Description of Properties

The properties used by Berkshire's business segments are summarized in this section. Berkshire's railroad and utilities and energy businesses, in particular, utilize considerable physical assets in their businesses.

Railroad Business—Burlington Northern Santa Fe

Through BNSF Railway, BNSF operates over 32,500 route miles of track (excluding multiple main tracks, yard tracks and sidings) in 28 states, and also operates in three Canadian provinces. BNSF owns over 23,000 route miles, including easements, and operates over 9,000 route miles of trackage rights that permit BNSF to operate its trains with its crews over other railroads' tracks. As of December 31, 2021, the total BNSF Railway system, including single and multiple main tracks, yard tracks and sidings, consisted of over 50,000 operated miles of track.

BNSF operates various facilities and equipment to support its transportation system, including its infrastructure, locomotives and freight cars. It also owns or leases other equipment to support rail operations, such as vehicles. Support facilities for rail operations include yards and terminals throughout its rail network, system locomotive shops to perform locomotive servicing and maintenance, a centralized network operations center for train dispatching and network operations monitoring and management, computers, telecommunications equipment, signal systems and other support systems. Transfer facilities are maintained for rail-to-rail as well as intermodal transfer of containers, trailers and other freight traffic and include approximately 25 intermodal hubs located across the system. BNSF owns or holds under non-cancelable leases exceeding one year approximately 7,500 locomotives and 63,600 freight cars, in addition to maintenance of way and other equipment.

In the ordinary course of business, BNSF incurs significant costs in repairing and maintaining its properties. In 2021, BNSF recorded approximately $2 billion in repairs and maintenance expense.

Utilities and Energy Businesses—Berkshire Hathaway Energy

BHE's energy properties consist of the physical assets necessary to support its electricity and natural gas businesses. Properties of BHE's electricity businesses include electric generation, transmission and distribution facilities, as well as coal mining assets that support certain of BHE's electric generating facilities. Properties of BHE's natural gas businesses include natural gas distribution facilities, interstate pipelines, storage facilities, liquefied natural gas facilities, compressor stations and meter stations. The transmission and distribution assets are primarily within each of BHE's utility service territories. In addition to these physical assets, BHE has rights-of-way, mineral rights and water rights that enable BHE to utilize its facilities. Pursuant to separate financing agreements, the majority of these properties are pledged or encumbered to support or otherwise provide the security for the related subsidiary debt. BHE or its affiliates own or have interests in the following types of operating electric generating facilities at December 31, 2021:

Energy Source	Entity	Location by Significance	Facility Net Capacity (MW) (1)	Net Owned Capacity (MW) (1)
Wind	PacifiCorp, MEC and BHE Renewables	Iowa, Wyoming, Texas, Nebraska, Washington, California, Illinois, Montana, Oregon and Kansas	11,517	11,517
Natural gas	PacifiCorp, MEC, NV Energy, BHE Renewables and BHE Canada	Nevada, Utah, Iowa, Illinois, Washington, Wyoming, Oregon, Texas, New York, Arizona and Canada	11,112	10,833
Coal	PacifiCorp, MEC and NV Energy	Wyoming, Iowa, Utah, Nevada, Colorado and Montana	13,235	8,193
Solar	BHE Renewables and NV Energy	California, Texas, Arizona, Minnesota and Nevada	1,719	1,571
Hydroelectric	PacifiCorp, MEC and BHE Renewables	Washington, Oregon, Idaho, California, Utah, Hawaii, Montana, Illinois and Wyoming	1,149	1,149
Nuclear	MEC	Illinois	1,823	456
Geothermal	PacifiCorp and BHE Renewables	California and Utah	377	377
		Total	40,932	34,096

(1) *Facility Net Capacity in megawatts (MW) represents the lesser of nominal ratings or any limitations under applicable interconnection, power purchase, or other agreements for intermittent resources and the total net dependable capability available during summer conditions for all other units. An intermittent resource's nominal rating is the manufacturer's contractually specified capability (in MW) under specified conditions. Net Owned Capacity indicates BHE's ownership of Facility Net Capacity.*

As of December 31, 2021, BHE's subsidiaries also have electric generating facilities that are under construction in Nevada, Iowa and Canada having total Facility Net Capacity and Net Owned Capacity of 421 MW.

PacifiCorp, MEC and NV Energy own electric transmission and distribution systems, including approximately 27,700 miles of transmission lines and approximately 1,660 substations and gas distribution facilities, including approximately 27,700 miles of gas mains and service lines.

Northern Powergrid (Northeast) and Northern Powergrid (Yorkshire) operate an electricity distribution network that includes approximately 17,400 miles of overhead lines, approximately 43,300 miles of underground cables and approximately 780 major substations. AltaLink's electricity transmission system includes approximately 8,200 miles of transmission lines and approximately 310 substations.

The BHE GT&S pipeline system consists of approximately 5,400 miles of natural gas transmission, gathering and storage pipelines located in portions of Maryland, New York, Ohio, Pennsylvania, Virginia, West Virginia, South Carolina and Georgia. Storage services are provided through the operation of 17 underground natural gas storage fields located in Pennsylvania, West Virginia and New York. BHE GT&S also operates, as the general partner, and owns a 25% limited partnership interest in one liquefied natural gas export, import and storage facility in Maryland and operates and has ownership interests in three modular liquefied natural gas facilities in Alabama, Florida and Pennsylvania.

Northern Natural's pipeline system consists of approximately 14,300 miles of natural gas pipelines, including approximately 5,800 miles of mainline transmission pipelines and approximately 8,500 miles of branch and lateral pipelines. Northern Natural's end-use and distribution market area includes points in Iowa, Nebraska, Minnesota, Wisconsin, South Dakota, Michigan and Illinois and its natural gas supply and delivery service area includes points in Kansas, Texas, Oklahoma and New Mexico. Storage services are provided through the operation of one underground natural gas storage field in Iowa, two underground natural gas storage facilities in Kansas and two liquefied natural gas storage peaking units, one in Iowa and one in Minnesota.

Kern River's system consists of approximately 1,400 miles of natural gas pipelines, which extends from the system's point of origination in Wyoming through the Central Rocky Mountains into California.

Other Segments

Significant physical properties used by Berkshire's other business segments are summarized below:

Business	Country	Locations	Property/ Facility type	Number of Properties Owned	Number of Properties Leased
Insurance:					
GEICO	U.S.		Offices and claims centers	10	113
BHRG	U.S.		Offices	1	27
	Non-U.S.	Locations in 23 countries	Offices	1	37
BH Primary	U.S.		Offices	5	48
	Non-U.S.	Locations in 7 countries	Offices	—	15
Manufacturing	U.S.		Manufacturing facility	484	113
			Offices/ Warehouses	214	476
			Retail/ Showroom	231	195
			Housing subdivisions	319	—
	Non-U.S.	Locations in 63 countries	Manufacturing facility	179	111
			Offices/ Warehouses	106	437
			Retail/ Showroom	—	4
Service	U.S.		Training facilities/ Hangars	12	93
			Offices/ Distribution	15	135
			Production facilities	4	3
			Leasing/ Showroom/ Retail	31	49
	Non-U.S.	Locations in 19 countries	Training facilities/ Hangars	1	12
			Offices/ Distribution	—	47

McLane	U.S.		Distribution centers	59	27
			Offices	4	1
Retailing	U.S.		Offices/ Warehouses	23	27
			Retail/ Showroom	139	498
	Non-U.S.	Locations in 6 countries	Offices/ Warehouses	1	7
			Retail/ Offices	—	91

Item 3. Legal Proceedings

Berkshire and its subsidiaries are parties in a variety of legal actions that routinely arise out of the normal course of business, including legal actions seeking to establish liability directly through insurance contracts or indirectly through reinsurance contracts issued by Berkshire subsidiaries. Plaintiffs occasionally seek punitive or exemplary damages. We do not believe that such normal and routine litigation will have a material effect on our financial condition or results of operations. Berkshire and certain of its subsidiaries are also involved in other kinds of legal actions, some of which assert or may assert claims or seek to impose fines and penalties. We believe that any liability that may arise as a result of other pending legal actions will not have a material effect on our consolidated financial condition or results of operations.

Item 4. Mine Safety Disclosures

Information regarding the Company's mine safety violations and other legal matters disclosed in accordance with Section 1503 (a) of the Dodd-Frank Reform Act is included in Exhibit 95 to this Form 10-K.

Executive Officers of the Registrant

Following is a list of the Registrant's named executive officers:

Name	Age	Position with Registrant	Since
Warren E. Buffett	91	Chairman and Chief Executive Officer	1970
Charles T. Munger	98	Vice Chairman	1978
Gregory E. Abel	59	Vice Chairman – Non-Insurance Operations	2018
Ajit Jain	70	Vice Chairman – Insurance Operations	2018
Marc D. Hamburg	72	Senior Vice-President – Chief Financial Officer	1992

Each executive officer serves, in accordance with the by-laws of the Registrant, until the first meeting of the Board of Directors following the next annual meeting of shareholders and until a successor is chosen and qualified or until such executive officer sooner dies, resigns, is removed or becomes disqualified.

FORWARD-LOOKING STATEMENTS

Investors are cautioned that certain statements contained in this document as well as some statements in periodic press releases and some oral statements of Berkshire officials during presentations about Berkshire or its subsidiaries are "forward-looking" statements within the meaning of the Private Securities Litigation Reform Act of 1995 (the "Act"). Forward-looking statements include statements which are predictive in nature, which depend upon or refer to future events or conditions, or which include words such as "expects," "anticipates," "intends," "plans," "believes," "estimates" or similar expressions. In addition, any statements concerning future financial performance (including future revenues, earnings or growth rates), ongoing business strategies or prospects and possible future Berkshire actions, which may be provided by management, are also forward-looking statements as defined by the Act. Forward-looking statements are based on current expectations and projections about future events and are subject to risks, uncertainties and assumptions about Berkshire and its subsidiaries, economic and market factors and the industries in which we do business, among other things. These statements are not guarantees of future performance and we have no specific intention to update these statements.

Actual events and results may differ materially from those expressed or forecasted in forward-looking statements due to a number of factors. The principal risk factors that could cause our actual performance and future events and actions to differ materially from such forward-looking statements include, but are not limited to, changes in market prices of our investments in fixed maturity and equity securities; losses realized from derivative contracts; the occurrence of one or more catastrophic events, such as an earthquake, hurricane, act of terrorism or cyber-attack that causes losses insured by our insurance subsidiaries and/or losses to our business operations; the frequency and severity of epidemics, pandemics or other outbreaks, including COVID-19, that negatively affect our operating results and restrict our access to borrowed funds through the capital markets at reasonable rates; changes in laws or regulations affecting our insurance, railroad, utilities and energy and finance subsidiaries; changes in federal income tax laws; and changes in general economic and market factors that affect the prices of securities or the industries in which we do business.

Part II

Item 5. Market for Registrant's Common Equity, Related Security Holder Matters and Issuer Purchases of Equity Securities

Market Information

Berkshire's Class A and Class B common stock are listed for trading on the New York Stock Exchange, trading symbols: BRK.A and BRK.B, respectively.

Shareholders

Berkshire had approximately 1,400 record holders of its Class A common stock and 18,400 record holders of its Class B common stock at February 15, 2022. Record owners included nominees holding at least 346,000 shares of Class A common stock and 1,287,000,000 shares of Class B common stock on behalf of beneficial-but-not-of-record owners.

Dividends

Berkshire has not declared a cash dividend since 1967.

Common Stock Repurchase Program

Berkshire's common stock repurchase program permits Berkshire to repurchase its Class A and Class B shares at any time that Warren Buffett, Berkshire's Chairman of the Board and Chief Executive Officer, and Charles Munger, Vice Chairman of the Board, believe that the repurchase price is below Berkshire's intrinsic value, conservatively determined. Repurchases may be in the open market or through privately negotiated transactions. Information with respect to Berkshire's Class A and Class B common stock repurchased during the fourth quarter of 2021 follows.

Period	Total number of shares purchased	Average price paid per share	Total number of shares purchased as part of publicly announced program	Maximum number or value of shares that yet may be repurchased under the program
October				
Class A common stock	680	$ 431,525.72	680	*
Class B common stock	5,862,551	$ 282.86	5,862,551	*
November				
Class A common stock	403	$ 430,172.46	403	*
Class B common stock	7,013,482	$ 284.39	7,013,482	*
December				
Class A common stock	1,828	$ 439,625.92	1,828	*
Class B common stock	6,259,164	$ 287.62	6,259,164	*

* *The program does not specify a maximum number of shares to be repurchased or obligate Berkshire to repurchase any specific dollar amount or number of Class A or Class B shares and there is no expiration date to the repurchase program. Berkshire will not repurchase its common stock if the repurchases reduce the total value of Berkshire's consolidated cash, cash equivalents and U.S. Treasury Bills holdings to less than $30 billion.*

Stock Performance Graph

The following chart compares the subsequent value of $100 invested in Berkshire common stock on December 31, 2016 with a similar investment in the Standard & Poor's 500 Stock Index and in the Standard & Poor's Property – Casualty Insurance Index**.

* *Cumulative return for the Standard & Poor's indices based on reinvestment of dividends.*

** *It would be difficult to develop a peer group of companies similar to Berkshire. The Corporation owns subsidiaries engaged in a number of diverse business activities of which the most important is the property and casualty insurance business and, accordingly, management has used the Standard & Poor's Property—Casualty Insurance Index for comparative purposes.*

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

Results of Operations

Net earnings attributable to Berkshire Hathaway shareholders for each of the past three years are disaggregated in the table that follows. Amounts are after deducting income taxes and exclude earnings attributable to noncontrolling interests (in millions).

	2021	2020	2019
Insurance – underwriting	$ 728	$ 657	$ 325
Insurance – investment income	4,807	5,039	5,530
Railroad	5,990	5,161	5,481
Utilities and energy	3,495	3,091	2,840
Manufacturing, service and retailing	11,120	8,300	9,372
Investment and derivative gains/losses	62,340	31,591	57,445
Other*	1,315	(11,318)	424
Net earnings attributable to Berkshire Hathaway shareholders	$ 89,795	$ 42,521	$ 81,417

* *Includes goodwill and indefinite-lived intangible asset impairment charges of $259 million in 2021, $11.0 billion in 2020 and $435 million in 2019, which includes our share of charges recorded by Kraft Heinz.*

Through our subsidiaries, we engage in numerous diverse business activities. We manage our operating businesses on an unusually decentralized basis. There are few centralized or integrated business functions. Our senior corporate management team participates in and is ultimately responsible for significant capital allocation decisions, investment activities and the selection of the Chief Executive to head each of the operating businesses. The business segment data (Note 25 to the accompanying Consolidated Financial Statements) should be read in conjunction with this discussion.

The COVID-19 pandemic negatively affected most of our businesses beginning in March of 2020, with the effects to date ranging from relatively minor to severe. Earnings of most of our manufacturing, service and retailing businesses declined considerably, and in certain instances severely, in the second quarter of 2020. Over the second half of 2020 and continuing in 2021, many of these businesses experienced significant recoveries in revenues and earnings, in some instances exceeding pre-pandemic levels. However, many of our businesses were negatively affected by ongoing global supply chain disruptions, including those attributable to major winter storms and a hurricane in North America, which contributed to higher input costs. We cannot reliably predict future economic effects of the pandemic or when business activities at our operations will completely normalize. Nor can we predict how these events will alter the future consumption patterns of consumers and businesses we serve.

Our insurance businesses generated after-tax earnings from underwriting of $728 million in 2021, $657 million in 2020 and $325 million in 2019. In each year, we generated underwriting earnings from primary insurance and underwriting losses from reinsurance. Insurance underwriting results included after-tax losses from significant catastrophe events of approximately $2.3 billion in 2021, $750 million in 2020 and $800 million in 2019. Underwriting results in 2021 were favorably impacted by reductions in incurred losses for prior accident years under property and casualty contracts. Underwriting results in 2021 were negatively impacted by reductions in earned premium from the GEICO Giveback program, higher private passenger auto claims frequencies and severities estimates and higher losses in the life reinsurance business. Underwriting results in 2020 included the effects of the pandemic, arising from premium reductions from the GEICO Giveback program, reduced claims frequencies for private passenger automobile insurance and increased loss estimates for certain commercial insurance and property and casualty reinsurance business.

After-tax earnings from insurance investment income in 2021 decreased 4.6% compared to 2020 and declined 8.9% in 2020 versus 2019. Earnings in 2021 and 2020 were negatively affected by declines in interest rates on our substantial holdings of cash and U.S. Treasury Bills.

After-tax earnings of our railroad business in 2021 rose 16.1% compared to 2020 and decreased 5.8% in 2020 compared to 2019. The earnings increase in 2021 reflected overall higher freight volumes, higher average revenue per car/unit and improved productivity, partly offset by higher average fuel prices and volume related costs. Earnings in 2020 reflected lower railroad operating revenues from lower shipping volumes, attributable to the negative effects of the COVID-19 pandemic, partly offset by lower operating costs and the effects of productivity improvements. After-tax earnings of our utilities and energy business in 2021 increased 13.1% versus 2020 and increased 8.8% in 2020 compared to 2019. The increase in 2021 included higher earnings from the utilities and natural gas pipelines businesses, including the effects of a business acquisition, and from the real estate brokerage business, while the earnings increase in 2020 reflected increased tax benefits from renewable energy and increased earnings from the real estate brokerage business.

Earnings in 2021 from our manufacturing, service and retailing businesses increased 34.0% versus 2020 and declined 11.4% in 2020 versus 2019. Many of our businesses generated significantly higher earnings in 2021 compared to 2020. While customer demand for products was relatively high during the year, several of our businesses experienced higher materials, freight and other input costs attributable to ongoing disruptions in global supply chains. The effects of the COVID-19 pandemic have varied among our businesses relative to significance and duration.

Other earnings included after-tax goodwill and indefinite-lived intangible asset impairment charges of $259 million in 2021, $11.0 billion in 2020 and $435 million in 2019. Such amounts included our share of impairment charges recorded by Kraft Heinz. Approximately $9.8 billion of the charges in 2020 were attributable to impairments of goodwill and indefinite-lived intangible assets recorded in connection with Berkshire's acquisition of Precision Castparts in 2016. Other earnings in 2021 also included after-tax foreign exchange rate gains of $955 million and after-tax losses of $764 million in 2020 related to non-U.S. Dollar denominated debt issued by Berkshire and its U.S.-based finance subsidiary, Berkshire Hathaway Finance Corporation ("BHFC").

Investment and derivative gains/losses in each of the three years presented predominantly derived from our investments in equity securities and included significant net unrealized gains from market price changes. We believe that investment and derivative gains/losses, whether realized from dispositions or unrealized from changes in market prices of equity securities, are generally meaningless in understanding our reported quarterly or annual results or evaluating the economic performance of our operating businesses. These gains and losses have caused and will continue to cause significant volatility in our periodic earnings.

Insurance—Underwriting

Our management views our insurance businesses as possessing two distinct activities – underwriting and investing. Underwriting decisions are the responsibility of the unit managers, while investing decisions are the responsibility of Berkshire's Chairman and CEO, Warren E. Buffett and Berkshire's corporate investment managers. Accordingly, we evaluate performance of underwriting operations without any allocation of investment income or investment gains and losses. We consider investment income as an integral component of our aggregate insurance operating results. However, we consider investment gains and losses, whether realized or unrealized, as non-operating. We believe that such gains and losses are not meaningful in understanding the periodic operating results of our insurance businesses.

The timing and magnitude of catastrophe losses can produce significant volatility in our periodic underwriting results, particularly with respect to our reinsurance businesses. Generally, we consider incurred losses exceeding $100 million from a current year catastrophic event to be significant. The significant catastrophe events in 2021 included Hurricane Ida and floods in Europe in the third quarter, as well as Winter Storm Uri in the first quarter.

Changes in estimates for unpaid losses and loss adjustment expenses, including amounts established for occurrences in prior years, can also significantly affect our periodic underwriting results. Unpaid loss estimates, including estimates under retroactive reinsurance contracts, were approximately $125 billion as of December 31, 2021. Our periodic underwriting results may also include significant foreign currency transaction gains and losses arising from the changes in the valuation of non-U.S. Dollar denominated liabilities of our U.S. based insurance subsidiaries due to foreign currency exchange rate fluctuations.

Insurance—Underwriting *(Continued)*

Underwriting results of certain of our commercial insurance and reinsurance businesses were negatively affected in 2021 and 2020 by estimated losses and costs associated with the COVID-19 pandemic, including incremental provisions for claims and uncollectible premiums and incremental operating costs to maintain customer service levels. The effects of the pandemic on future periods may be affected by judicial rulings and regulatory and legislative actions pertaining to insurance coverage and claims and by its effects on general economic activity, which we cannot reasonably estimate at this time.

We provide primary insurance and reinsurance products covering property and casualty risks, as well as life and health risks. Our insurance and reinsurance businesses are GEICO, Berkshire Hathaway Primary Group and Berkshire Hathaway Reinsurance Group.

Underwriting results of our insurance businesses are summarized below (dollars in millions).

	2021	2020	2019
Pre-tax underwriting earnings (loss):			
GEICO	$ 1,259	$ 3,428	$ 1,506
Berkshire Hathaway Primary Group	607	110	383
Berkshire Hathaway Reinsurance Group	(930)	(2,700)	(1,472)
Pre-tax underwriting earnings	936	838	417
Income taxes and noncontrolling interests	208	181	92
Net underwriting earnings	$ 728	$ 657	$ 325
Effective income tax rate	22.2%	21.5%	24.2%

GEICO

GEICO writes private passenger automobile insurance, offering coverages to insureds in all 50 states and the District of Columbia. GEICO markets its policies mainly by direct response methods where most customers apply for coverage directly to the company via the Internet or over the telephone. A summary of GEICO's underwriting results follows (dollars in millions).

	2021		2020		2019	
	Amount	%	Amount	%	Amount	%
Premiums written	$ 38,395		$ 34,928		$ 36,016	
Premiums earned	$ 37,706	100.0	$ 35,093	100.0	$ 35,572	100.0
Losses and loss adjustment expenses	30,999	82.2	26,018	74.1	28,937	81.3
Underwriting expenses	5,448	14.5	5,647	16.1	5,129	14.5
Total losses and expenses	36,447	96.7	31,665	90.2	34,066	95.8
Pre-tax underwriting earnings	$ 1,259		$ 3,428		$ 1,506	

GEICO's pre-tax underwriting earnings in 2021 and 2020 were significantly affected by changes in average claims frequencies. Beginning in the first quarter of 2020 and continuing through the first quarter of 2021, average claims frequencies were significantly below historical levels from the effects of less driving by policyholders during the COVID-19 pandemic. These effects were partially offset by higher average claims severities and lower premiums earned from the GEICO Giveback program, which provided for a 15% premium credit to all voluntary auto and motorcycle new policies or policies renewing between April 8, 2020 and October 7, 2020. Starting in the second quarter of 2021, average claims frequencies began to increase as driving by policyholders increased. In addition, average property claims severities increased due to increases in used vehicle valuations.

Insurance—Underwriting *(Continued)*

GEICO (Continued)

2021 versus 2020

Premiums written in 2021 increased $3.5 billion (9.9%) compared to 2020, which included a reduction of approximately $2.9 billion attributable to the GEICO Giveback program. Premiums earned in 2021 increased $2.6 billion (7.4%) compared to 2020. The GEICO Giveback Program reduced earned premiums by approximately $2.5 billion in 2020 with the remainder of the impact included in 2021. Voluntary auto policies-in-force in 2021 were slightly higher compared to 2020.

Losses and loss adjustment expenses increased $5.0 billion (19.1%) compared to 2020. GEICO's ratio of losses and loss adjustment expenses to premiums earned (the "loss ratio") increased 8.1 percentage points compared to 2020. The increase in the loss ratio reflected an increase in average claims frequencies and severities and higher losses from significant catastrophe events, partially offset by increased reductions of ultimate estimated losses for claims occurring in prior years.

Claims frequencies in 2021 were higher for all coverages, including property damage and bodily injury (thirteen to fourteen percent range), personal injury (sixteen to seventeen percent range) and collision (twenty-one to twenty-two percent range). Average claims severities in 2021 were also higher for property damage coverage (two to three percent range), collision coverage (fifteen to sixteen percent range) and bodily injury coverage (eight to ten percent range). Ultimate claim loss estimates for claims occurring in prior years were reduced approximately $1.8 billion in 2021 and $253 million in 2020, which produced corresponding reductions in losses and loss adjustment expenses. Losses incurred attributable to Hurricane Ida in 2021 were $375 million, while losses in 2020 included $81 million attributable to Hurricanes Laura and Sally and U.S. wildfires.

Underwriting expenses decreased $199 million (3.5%) compared to 2020, reflecting lower advertising expenses. GEICO's expense ratio (underwriting expenses to premiums earned) decreased 1.6 percentage points in 2021, reflecting lower nominal expenses and higher premiums earned.

2020 versus 2019

Premiums written and earned in 2020 decreased $1.1 billion (3.0%) and $479 million (1.3%), respectively, compared to 2019. The GEICO Giveback program reduced premiums written $2.9 billion and premiums earned $2.5 billion in 2020. Voluntary auto policies-in-force increased approximately 820,000 during 2020.

Losses and loss adjustment expenses in 2020 decreased $2.9 billion (10.1%) compared to 2019. GEICO's loss ratio was 74.1%, a decrease of 7.2 percentage points compared to 2019. The decrease in the loss ratio reflected declines in claims frequencies, partly offset by increases in claims severities and the impact of lower premiums earned attributable to the GEICO Giveback program.

Claims frequencies in 2020 were lower for property damage, bodily injury and personal injury protection coverages (twenty-eight to thirty percent range) and collision coverage (twenty-three to twenty-four percent range) compared to 2019. Average claims severities in 2020 were higher for property damage and collision coverages (eight to ten percent range) and bodily injury coverage (twelve to thirteen percent range). Losses and loss adjustment expenses included net reductions of $253 million in 2020 for decreases in the ultimate loss estimates for claims occurring in prior years compared to net increases of $42 million in 2019. Losses incurred included $81 million in 2020 from Hurricanes Laura and Sally and U.S. wildfires. There were no losses from significant catastrophe events in 2019.

Underwriting expenses in 2020 increased $518 million (10.1%) compared to 2019, reflecting higher employee-related, advertising and technology costs, partly offset by lower premium taxes. GEICO's expense ratio in 2020 was 16.1%, an increase of 1.6 percentage points compared to 2019. The expense ratio increase was primarily attributable to the decline in earned premiums from the GEICO Giveback program.

Insurance—Underwriting *(Continued)*

Berkshire Hathaway Primary Group

The Berkshire Hathaway Primary Group ("BH Primary") provides a variety of commercial insurance solutions, including healthcare professional liability, workers' compensation, automobile, general liability, property and specialty coverages for small, medium and large clients. BH Primary's larger insurers include Berkshire Hathaway Specialty Insurance ("BH Specialty"), Berkshire Hathaway Homestate Companies ("BHHC"), MedPro Group, Berkshire Hathaway GUARD Insurance Companies ("GUARD"), National Indemnity Company ("NICO Primary") and U.S. Liability Insurance Company ("USLI"). A summary of BH Primary underwriting results follows (dollars in millions).

	2021		2020		2019	
	Amount	%	Amount	%	Amount	%
Premiums written	$ 12,595		$ 10,212		$ 9,843	
Premiums earned	$ 11,575	100.0	$ 9,615	100.0	$ 9,165	100.0
Losses and loss adjustment expenses	8,107	70.0	7,129	74.1	6,336	69.1
Underwriting expenses	2,861	24.8	2,376	24.7	2,446	26.7
Total losses and expenses	10,968	94.8	9,505	98.8	8,782	95.8
Pre-tax underwriting earnings	$ 607		$ 110		$ 383	

Premiums written increased $2.4 billion (23.3%) in 2021 compared to 2020, reflecting increases from BH Specialty (36%), MedPro Group (16%), NICO Primary (25%), GUARD (7%), BHHC (5%) and USLI (20%). The increases were across multiple coverages and occurred in several markets.

Premiums written increased $369 million (3.7%) in 2020 compared to 2019, reflecting increased premiums written from BH Specialty (34%) and MedPro Group (9%), partially offset by a 13% decrease in premiums written by our other primary insurers. The decline in volume by our other primary insurers was primarily due to lower workers' compensation and commercial automobile volumes and the effect of the divestiture of Applied Underwriters in October 2019.

BH Primary's loss ratios were 70.0% in 2021, 74.1% in 2020 and 69.1% in 2019. Losses and loss adjustment expenses attributable to significant catastrophe events were $402 million in 2021 from Hurricane Ida and Winter Storm Uri and $207 million in 2020 from Hurricanes Laura and Sally and U.S. wildfires. Losses and loss adjustment expenses were reduced $631 million in 2021, $265 million in 2020 and $499 million in 2019 for net reductions in estimated ultimate liabilities for prior years' loss events. Losses in 2020 also included increased liabilities of $167 million attributable to the pandemic.

BH Primary insurers write significant levels of commercial and professional liability and workers' compensation insurance and the related claim costs may be subject to high severity and long claim-tails. Accordingly, we could experience significant increases in claims liabilities in the future attributable to higher-than-expected claim settlements, adverse litigation outcomes or judicial rulings and other factors not currently anticipated.

Underwriting expenses increased $485 million (20.4%) in 2021 compared to 2020, reflecting the increase in business, changes in business mix and the costs associated with new product development. The expense ratio in 2021 was relatively unchanged versus 2020. The expense ratio in 2020 declined 2.0 percentage points compared to 2019 and reflected changes in business mix and the impact of the Applied Underwriters divestiture.

Berkshire Hathaway Reinsurance Group

The Berkshire Hathaway Reinsurance Group ("BHRG") offers excess-of-loss and quota-share reinsurance coverages on property and casualty risks to insurers and reinsurers worldwide through several subsidiaries, led by National Indemnity Company ("NICO"), General Reinsurance Corporation and General Reinsurance AG. We also write life and health reinsurance coverages through General Re Life Corporation, General Reinsurance AG and Berkshire Hathaway Life Insurance Company of Nebraska ("BHLN"). We periodically assume property and casualty risks under retroactive reinsurance contracts written through NICO. In addition, we write periodic payment annuity contracts through BHLN.

Generally, we strive to generate underwriting profits. However, time-value-of-money concepts are important elements in establishing prices for retroactive reinsurance and periodic payment annuity businesses due to the expected long durations of the claim liabilities. We expect to incur pre-tax underwriting losses from such businesses, primarily through deferred charge amortization and discount accretion charges. We receive premiums at the inception of these contracts, which are then available for investment. A summary of BHRG's premiums and pre-tax underwriting results follows (dollars in millions).

	Premiums written			Premiums earned			Pre-tax underwriting earnings (loss)		
	2021	2020	2019	2021	2020	2019	2021	2020	2019
Property/casualty	$14,149	$13,295	$10,428	$13,740	$12,214	$ 9,911	$ 667	$ (799)	$ 16
Life/health	5,621	5,848	4,963	5,648	5,861	4,869	(421)	(18)	159
Retroactive reinsurance	136	38	684	136	38	684	(782)	(1,248)	(1,265)
Periodic payment annuity	658	566	863	658	566	863	(508)	(617)	(549)
Variable annuity	15	14	14	15	14	14	114	(18)	167
	$20,579	$19,761	$16,952	$20,197	$18,693	$16,341	$ (930)	$(2,700)	$(1,472)

Property/casualty

A summary of property/casualty reinsurance underwriting results follows (dollars in millions).

	2021		2020		2019	
	Amount	%	Amount	%	Amount	%
Premiums written	$ 14,149		$ 13,295		$ 10,428	
Premiums earned	$ 13,740	100.0	$ 12,214	100.0	$ 9,911	100.0
Losses and loss adjustment expenses	9,878	71.9	9,898	81.0	7,313	73.8
Underwriting expenses	3,195	23.2	3,115	25.5	2,582	26.0
Total losses and expenses	13,073	95.1	13,013	106.5	9,895	99.8
Pre-tax underwriting earnings (loss)	$ 667		$ (799)		$ 16	

Premiums written increased $854 million (6.4%) in 2021 compared to 2020, primarily attributable to net new business, increased participations and improved prices on renewals and favorable currency translation effects. The increase was primarily attributable to property coverages. Premiums written increased $2.9 billion (27.5%) in 2020 compared to 2019. The increase was primarily attributable to net new business and increased participations on renewals.

Losses and loss adjustment expenses were relatively unchanged in 2021 compared to 2020, while the loss ratio decreased 9.1 percentage points. The loss ratio was 71.9% in 2021, 81.0% in 2020 and 73.8% in 2019. Losses incurred arising from significant catastrophe events in 2021 (Hurricane Ida, flooding in Europe and Winter Storm Uri) were $2.1 billion, which were partially offset by reductions in estimated ultimate liabilities for losses occurring in prior years of $718 million. Losses incurred in 2020 included $667 million from significant catastrophe events (Hurricanes Laura and Sally and U.S. wildfires), losses attributable to the COVID-19 pandemic of $964 million and increases in estimated ultimate liabilities for losses occurring in prior years of $162 million. Incurred losses from significant catastrophe events during 2019 were $1.0 billion and derived from Typhoons Faxai and Hagibis and various U.S. and non-U.S. wildfires, which were partially offset by reductions in estimated ultimate liabilities for losses occurring in prior years of $295 million.

Underwriting expenses are primarily commissions and brokerage costs. The expense ratio in 2021 decreased 2.3 percentage points compared to 2020, primarily attributable to changes in business mix and foreign currency effects. Underwriting expenses increased $533 million (20.6%) in 2020 compared to 2019, reflecting the increase in premiums earned.

Insurance—Underwriting *(Continued)*

Berkshire Hathaway Reinsurance Group (Continued)

Life/health

A summary of our life/health reinsurance underwriting results follows (dollars in millions).

	2021		2020		2019	
	Amount	**%**	**Amount**	**%**	**Amount**	**%**
Premiums written	$ 5,621		$ 5,848		$ 4,963	
Premiums earned	$ 5,648	100.0	$ 5,861	100.0	$ 4,869	100.0
Life and health insurance benefits	4,933	87.3	4,883	83.3	3,800	78.0
Underwriting expenses	1,136	20.2	996	17.0	910	18.7
Total benefits and expenses	6,069	107.5	5,879	100.3	4,710	96.7
Pre-tax underwriting earnings (loss)	$ (421)		$ (18)		$ 159	

Life/health premiums written decreased $227 million (3.9%) in 2021 compared to 2020. Premiums written in 2020 included $710 million from a contract that covered U.S. health risks that incepted in the fourth quarter of 2019 and did not renew in 2021. Otherwise, premiums written in 2021 increased 9.4% versus 2020, primarily due to volume growth in the Asia Pacific region and favorable foreign currency translation effects. Underwriting results in 2021 were negatively affected by significant increases in mortality in the U.S., South Africa, India and Latin America, attributable to the pandemic.

Life/health premiums written increased $885 million (17.8%) in 2020 compared to 2019. Approximately $480 million of the increase was attributable to the contract covering U.S. health insurance risks, and the remainder of the increase was primarily from volume growth in Asia and Europe. Underwriting earnings in 2020 were negatively affected by increased life benefits from COVID-19-related claims and from increased liabilities from changes in underlying assumptions in estimating disability benefit liabilities in Australia, which were mostly offset by lower other life claims and reduced losses from U.S. long-term care business that is in run-off. Results in 2019 included a one-time pre-tax underwriting gain of $163 million attributable to an amendment of a yearly renewable term life contract.

Retroactive reinsurance

Pre-tax underwriting losses in each year derived from the amortization of deferred charges and changes in the estimated timing and amounts of future claim payments. Underwriting results also include foreign currency exchange gains and losses from the effects of changes in foreign currency exchange rates on non-U.S. Dollar denominated liabilities of our U.S. subsidiaries. Underwriting results included pre-tax foreign currency gains of $56 million in 2021 and losses of $139 million in 2020 and $76 million in 2019.

Pre-tax underwriting losses before foreign currency gains/losses were $838 million in 2021, $1.1 billion in 2020 and $1.2 billion in 2019. Estimated ultimate claim liabilities for contracts written in prior years were reduced $974 million in 2021 and $399 million in 2020. After adjustments to the related unamortized deferred charges from changes in the estimated timing and amount of the future claim payments, such reductions produced pre-tax underwriting earnings of $142 million in 2021 and $230 million in 2020.

Gross unpaid losses assumed under retroactive reinsurance contracts were $38.3 billion at December 31, 2021, a decline of $2.7 billion since December 31, 2020. The decline was primarily attributable to paid claims of approximately $1.9 billion and the reduction in estimated ultimate claim liabilities. Unamortized deferred charges related to retroactive reinsurance contracts were $10.6 billion at December 31, 2021, a decline of $1.8 billion since December 31, 2020, attributable to the effects of the changes in the estimated timing and amount of the future claim payments and periodic amortization. Deferred charge amortization will be included in underwriting earnings over the expected remaining claims settlement periods.

Insurance—Underwriting *(Continued)*

Berkshire Hathaway Reinsurance Group (Continued)

Periodic payment annuity

Periodic payment annuity premiums earned increased $92 million (16.3%) in 2021 compared to 2020, which decreased $297 million (34.4%) versus 2019. Periodic payment annuity business is both price and demand sensitive. Our premium volumes in 2021 and 2020 were affected by pandemic-related delays in underlying claim settlements, which reduced the supply of available business. Our volumes written may also change rapidly due to changes in prices, which are affected by prevailing interest rates, the perceived risks and durations associated with the expected annuity payments, as well as the level of competition.

Periodic payment annuity contracts normally produce pre-tax underwriting losses deriving from the recurring discount accretion of annuity liabilities. Underwriting results also include gains or losses from the effects of changes in mortality and interest rates and from foreign currency exchange rate changes on non-U.S. Dollar denominated liabilities of our U.S. subsidiaries. Pre-tax underwriting results included foreign currency gains of $18 million in 2021 and losses of $67 million in 2020 and $40 million in 2019.

Excluding foreign currency gains/losses, pre-tax underwriting losses from periodic payment annuity contracts were $526 million in 2021, $550 million in 2020 and $509 million in 2019. Pre-tax losses in 2021 were partially offset by the effects of higher mortality and by higher interest rates applicable to settlements under certain contracts. Discounted annuity liabilities were $15.1 billion at December 31, 2021 and had a weighted average discount rate of approximately 3.9%.

Variable annuity

Variable annuity guarantee reinsurance contracts produced pre-tax earnings of $114 million in 2021, losses of $18 million in 2020 and earnings of $167 million in 2019. The results from these contracts are affected by changes in securities markets, interest rates and foreign currency exchange rates, which can be volatile, and from the periodic amortization of expected profit margins. The comparative increase in underwriting earnings in 2021 was primarily attributable to the net effects of interest rate changes and, to a lesser extent, changes in securities markets.

Insurance—Investment Income

A summary of net investment income attributable to our insurance operations follows (dollars in millions).

				Percentage change	
	2021	**2020**	**2019**	**2021 vs 2020**	**2020 vs 2019**
Interest and other investment income	$ 589	$ 1,059	$ 2,075	(44.4)%	(49.0)%
Dividend income	5,060	4,890	4,525	3.5	8.1
Pre-tax net investment income	5,649	5,949	6,600	(5.0)	(9.9)
Income taxes and noncontrolling interests	842	910	1,070		
Net investment income	$ 4,807	$ 5,039	$ 5,530		
Effective income tax rate	14.9%	15.3%	16.1%		

Interest and other investment income declined $470 million (44.4%) in 2021 compared to 2020, which in turn, declined $1.0 billion (49.0%) compared to 2019. These declines were primarily due to lower income from short-term investments and fixed maturity securities. We continue to hold substantial balances of cash, cash equivalents and short-term U.S. Treasury Bills. Short-term interest rates declined over the second half of 2019 and throughout 2020. Low rates prevailed through 2021, which resulted in significantly lower interest income. Nevertheless, we believe that maintaining ample liquidity is paramount and we insist on safety over yield with respect to short-term investments.

Insurance—Investment Income *(Continued)*

Dividend income included $121 million in 2021 and $26 million in 2020 from investments in preferred stock of Berkshire Hathaway Energy. Such amounts are deducted from earnings of the utilities and energy segment. Dividend income may vary from period to period due to changes in the investment portfolio and the frequency and timing of dividends from certain investees. Dividend income increased $365 million (8.1%) in 2020 compared to 2019. The increase was primarily attributable to dividends from the investment in $10 billion liquidation value of 8% cumulative preferred stock of Occidental Petroleum Corporation ("Occidental") on August 8, 2019, partly offset by lower dividends from common stock investments.

Invested assets of our insurance businesses derive from shareholder capital and from net liabilities under insurance and reinsurance contracts or "float." The major components of float are unpaid losses and loss adjustment expenses, including liabilities under retroactive reinsurance contracts, life, annuity and health insurance benefit liabilities, unearned premiums and other liabilities due to policyholders, reduced by insurance premiums and reinsurance receivables, deferred charges assumed under retroactive reinsurance contracts and deferred policy acquisition costs. Float approximated $147 billion at December 31, 2021, $138 billion at December 31, 2020 and $129 billion at December 31, 2019. Our combined insurance operations generated pre-tax underwriting earnings in each of the past three years, and consequently, the average cost of float for each year was negative.

A summary of cash and investments held in our insurance businesses as of December 31, 2021 and 2020 follows (in millions).

	December 31,	
	2021	2020
Cash, cash equivalents and U.S. Treasury Bills	$ 90,688	$ 67,082
Equity securities	334,907	269,498
Fixed maturity securities	16,386	20,317
Other	4,296	6,220
	$ 446,277	$ 363,117

Fixed maturity investments as of December 31, 2021 were as follows (in millions).

	Amortized cost	Unrealized gains/losses	Carrying value
U.S. Treasury, U.S. government corporations and agencies	$ 3,278	$ 17	$ 3,295
Foreign governments	10,997	(4)	10,993
Corporate bonds	1,350	411	1,761
Other	292	45	337
	$ 15,917	$ 469	$ 16,386

U.S. government obligations are rated AA+ or Aaa by the major rating agencies. Approximately 93% of all foreign government obligations were rated AA or higher by at least one of the major rating agencies. Foreign government securities include obligations issued or unconditionally guaranteed by national or provincial government entities.

Railroad

Burlington Northern Santa Fe, LLC ("BNSF") operates one of the largest railroad systems in North America, with over 32,500 route miles of track in 28 states. BNSF also operates in three Canadian provinces. BNSF classifies its major business groups by type of product shipped including consumer products, industrial products, agricultural products and coal. A summary of BNSF's earnings follows (dollars in millions).

				Percentage change	
	2021	2020	2019	2021 vs 2020	2020 vs 2019
Railroad operating revenues	$ 22,513	$ 20,181	$ 22,745	11.6%	(11.3)%
Railroad operating expenses:					
Compensation and benefits	4,696	4,542	5,270	3.4	(13.8)
Fuel	2,766	1,789	2,944	54.6	(39.2)
Purchased services	2,033	1,954	2,049	4.0	(4.6)
Depreciation and amortization	2,444	2,460	2,389	(0.7)	3.0
Equipment rents, materials and other	1,763	1,684	2,028	4.7	(17.0)
Total	13,702	12,429	14,680	10.2	(15.3)
Railroad operating earnings	8,811	7,752	8,065	13.7	(3.9)
Other revenues (expenses):					
Other revenues	769	688	770	11.8	(10.6)
Other expenses, net	(687)	(611)	(515)	12.4	18.6
Interest expense	(1,032)	(1,037)	(1,070)	(0.5)	(3.1)
Pre-tax earnings	7,861	6,792	7,250	15.7	(6.3)
Income taxes	1,871	1,631	1,769	14.7	(7.8)
Net earnings	$ 5,990	$ 5,161	$ 5,481	16.1	(5.8)
Effective income tax rate	23.8%	24.0%	24.4%		

The following table summarizes BNSF's railroad freight volumes by business group (cars/units in thousands).

	Cars/Units			Percentage change	
	2021	2020	2019	2021 vs 2020	2020 vs 2019
Consumer products	5,673	5,266	5,342	7.7%	(1.4)%
Industrial products	1,709	1,622	1,931	5.4	(16.0)
Agricultural products	1,224	1,189	1,146	2.9	3.8
Coal	1,529	1,404	1,802	8.9	(22.1)
Total cars/units	10,135	9,481	10,221	6.9	(7.2)

2021 versus 2020

Railroad operating revenues increased 11.6% in 2021 compared to 2020, reflecting higher volumes of 6.9%, as well as a 3.5% increase in average revenue per car/unit resulting from business mix changes and higher fuel surcharge revenue attributable to higher fuel prices. Pre-tax earnings were $7.9 billion in 2021, an increase of 15.7% from 2020. The COVID-19 pandemic caused a significant economic slowdown that adversely affected our volumes in 2020. Revenue changes in 2021 were driven by continued improvements from the 2020 effects of the COVID-19 pandemic, partially offset by the ongoing disruptions in the global supply chain.

Railroad *(Continued)*

Operating revenues from consumer products increased 13.7% in 2021 to $8.3 billion compared to 2020, reflecting increased volumes of 7.7% and higher average revenue per car/unit. The volume increase was primarily due to growth in intermodal in both international and domestic shipments driven by increased retail sales, inventory replenishments by retailers and increased e-commerce activity.

Operating revenues from industrial products were $5.3 billion in 2021, an increase of 5.0% from 2020. Volumes increased 5.4% while average revenue per car/unit was nearly unchanged from 2020. The volume increase was primarily due to improvement in the U.S. industrial economy, driving higher volumes in the construction and building sectors, partially offset by lower petroleum volumes due to unfavorable market conditions in the energy sector.

Operating revenues from agricultural products increased 5.8% to $5.1 billion in 2021 compared to 2020. The revenue change reflected a volume increase of 2.9% due to higher domestic grain shipments and higher volumes of ethanol and related commodities, as well as higher revenue per car/unit.

Operating revenues from coal increased 21.5% to $3.2 billion in 2021 compared to 2020 attributable to higher volumes of 8.9% in 2021, as well as higher average revenue per car/unit. The volume increase in 2021 was attributable to increased electricity generation, higher natural gas prices and improved export demand.

Railroad operating expenses were $13.7 billion in 2021, an increase of $1.3 billion (10.2%) compared to 2020. The ratio of railroad operating expenses to railroad operating revenues decreased 0.7 percentage points to 60.9% in 2021 versus 2020. The increase in railroad operating expenses reflected higher volumes and higher average fuel prices, partially offset by the favorable impact of productivity improvements.

Compensation and benefits expenses increased $154 million (3.4%) in 2021 compared to 2020, primarily due to increased volumes, wage inflation and health and welfare costs, partially offset by productivity improvements. Fuel expenses increased $977 million (54.6%) compared to 2020, primarily due to higher average fuel prices. Purchased service expenses increased $79 million (4.0%) compared to 2020, primarily due to higher volumes and the effects of insurance recoveries in 2020 related to 2019 flooding, partially offset by improved productivity. Equipment rents, materials and other expenses increased $79 million (4.7%) compared to 2020, due to higher volume-related costs.

2020 versus 2019

Railroad operating revenues declined 11.3% in 2020 versus 2019, reflecting a 7.2% decrease in volume and a 4.5% decrease in average revenue per car/unit. The decrease in revenue per car/unit was attributable to lower fuel surcharge revenue driven by lower fuel prices and business mix changes. The overall volume decrease was primarily due to the COVID-19 pandemic, which severely impacted volumes through the first half of 2020 and caused significant economic disruptions that adversely affected the demand for transportation services. Volumes sequentially improved during the second half of 2020 from earlier periods and recovered overall to pre-pandemic levels by the end of the year.

Pre-tax earnings were $6.8 billion in 2020, a decrease of 6.3% from 2019, principally due to the negative impacts of the pandemic on volumes. In addition, pre-tax earnings in 2019 included an operating revenue increase related to the favorable outcome of an arbitration hearing and a retirement plan curtailment gain that is included in other expenses, net in the preceding table. These effects were partially offset by significant improvements in 2020 in service, system velocity and cost performance compared to 2019, along with lower costs related to severe winter weather and flooding on parts of the network, which negatively affected expenses and service levels in 2019.

Operating revenues from consumer products of $7.3 billion in 2020 declined 7.6% compared to 2019, primarily due to a 6.3% decrease in average revenue per car/unit along with lower volumes. The volume decrease was primarily due to the impact of the pandemic. Lower international and automotive volumes were offset by higher domestic intermodal volumes. Increased retail sales, inventory replenishments by retailers and e-commerce activity produced recovery of intermodal volumes in the second half of 2020.

Railroad *(Continued)*

Operating revenues from industrial products were $5.0 billion in 2020, a decrease of 17.0% from 2019. The decrease was primarily attributable to the decline in volume and to a lesser extent lower average revenue per car/unit. Volumes decreased primarily due to lower U.S. industrial production driven by the pandemic, including reduced production and demand in the energy sector, which lowered sand and petroleum products volume, and reduced steel demand, which lowered taconite volume.

Operating revenues from agricultural products increased 2.9% to $4.8 billion in 2020 compared to 2019. The increase was due to higher volumes, partially offset by slightly lower average revenue per car/unit. The volume increase was primarily due to higher grain and meal exports, partially offset by lower ethanol and sweeteners shipments.

Operating revenues from coal decreased 28.5% to $2.7 billion in 2020 compared to 2019. This decrease was primarily due to lower volumes, as well as lower revenues per car/unit. Volumes decreased primarily due to lower natural gas prices, lower electricity demand driven by the pandemic, utility coal plant retirements and mild temperatures.

Railroad operating expenses declined 15.3% to $12.4 billion in 2020 as compared to 2019. The ratio of railroad operating expenses to railroad operating revenues declined 2.9 percentage points to 61.6% in 2020 versus 2019. Railroad operating expenses in 2020 reflected lower volume-related costs, productivity improvements, the effects of cost control initiatives and improved weather conditions compared to 2019.

Compensation and benefits expenses decreased $728 million (13.8%) in 2020 compared to 2019, primarily due to lower employee counts associated with lower volume and improved workforce productivity. Fuel expenses decreased $1.2 billion (39.2%) compared to 2019, primarily due to lower average fuel prices, lower volumes and improved fuel efficiency. Purchased services expense declined $95 million (4.6%) compared to 2019. The decrease was primarily due to lower volume, improved productivity and higher insurance recoveries in 2020 related to network flooding in 2019. Equipment rents, materials and other expense decreased $344 million (17.0%) compared to 2019, primarily due to lower volume-related costs, the effects of cost controls and lower personal injury and derailment expenses.

Utilities and Energy

We currently own a 91.1% ownership interest in Berkshire Hathaway Energy Company ("BHE"), which operates a global energy business. BHE's domestic regulated utility interests include PacifiCorp, MidAmerican Energy Company ("MEC") and NV Energy. BHE subsidiaries also operate two regulated electricity distribution businesses referred to as Northern Powergrid in Great Britain. BHE's natural gas pipelines consist of five domestic regulated interstate natural gas pipeline systems and a 25% interest in a liquefied natural gas export, import and storage facility ("LNG interest"), which BHE operates and consolidates for financial reporting purposes. Three of the natural gas pipeline systems and the LNG interest were acquired on November 1, 2020 from Dominion Energy, Inc. ("BHE GT&S"). Other energy businesses include a regulated electricity transmission-only business in Alberta, Canada ("AltaLink, L.P.") and a diversified portfolio of mostly renewable independent power projects and investments. BHE also operates the largest residential real estate brokerage firm and one of the largest residential real estate brokerage franchise networks in the United States.

Utilities and Energy *(Continued)*

The rates our regulated businesses charge customers for energy and services are based in large part on the costs of business operations, including income taxes and a return on capital, and are subject to regulatory approval. To the extent such costs are not allowed in the approved rates, operating results will be adversely affected. A summary of BHE's net earnings follows (dollars in millions).

	2021	2020	2019
Revenues:			
Energy operating revenue	$ 18,935	$ 15,556	$ 15,371
Real estate operating revenue	6,215	5,396	4,473
Other income (loss)	(163)	79	270
Total revenue	24,987	21,031	20,114
Costs and expense:			
Energy cost of sales	5,504	4,187	4,586
Energy operating expense	8,535	7,539	6,824
Real estate operating costs and expense	5,710	4,885	4,251
Interest expense	2,054	1,941	1,835
Total costs and expense	21,803	18,552	17,496
Pre-tax earnings	3,184	2,479	2,618
Income tax expense (benefit)*	(1,177)	(1,010)	(526)
Net earnings after income taxes	4,361	3,489	3,144
Noncontrolling interests of BHE subsidiaries	399	71	18
Net earnings attributable to BHE	3,962	3,418	3,126
Noncontrolling interests and preferred stock dividends	467	327	286
Net earnings attributable to Berkshire Hathaway shareholders	$ 3,495	$ 3,091	$ 2,840
Effective income tax rate	(37.0)%	(40.7)%	(20.1)%

* *Includes significant production tax credits from wind-powered electricity generation.*

The discussion of BHE's operating results that follows is based on after-tax earnings, reflecting how the energy businesses are managed and evaluated. A summary of net earnings attributable to BHE follows (dollars in millions).

				Percentage change	
	2021	2020	2019	2021 vs 2020	2020 vs 2019
PacifiCorp	$ 889	$ 741	$ 773	20.0%	(4.1)%
MidAmerican Energy Company	883	818	781	7.9	4.7
NV Energy	439	410	365	7.1	12.3
Northern Powergrid	247	201	256	22.9	(21.5)
Natural gas pipelines	774	528	422	46.6	25.1
Other energy businesses	680	697	608	(2.4)	14.6
Real estate brokerage	387	375	160	3.2	134.4
Corporate interest and other	(337)	(352)	(239)	(4.3)	47.3
	$ 3,962	$ 3,418	$ 3,126	15.9	9.3

2021 versus 2020

PacifiCorp operates a regulated electric utility in portions of several Western states, including Utah, Oregon and Wyoming. After-tax earnings increased $148 million in 2021 compared to 2020. The increase reflected higher utility margin (operating revenue less cost of sales) and increased income tax benefits from the impacts of ratemaking as well as higher production tax credits recognized on new wind-powered generating facilities placed in-service. The earnings increase was partially offset by lower allowances for equity and borrowed funds used during construction and higher operating expenses. Operating expenses in 2021 reflected increased depreciation expense from the impacts of a deprecation study effective January 1, 2021, and incremental costs associated with wind-powered generating facilities placed in-service, offset by lower costs associated with wildfires and a settlement agreement.

Utilities and Energy *(Continued)*

PacifiCorp utility margin was $3.5 billion in 2021, an increase of $145 million compared to 2020. The increase reflected higher retail revenue from increases in customer volumes and higher wholesale and other revenue, partially offset by higher thermal generation and purchased power costs. Retail customer volumes increased 3.1% in 2021 as compared to 2020, primarily due to higher customer usage, an increase in the average number of customers and the favorable impacts of weather.

MEC operates a regulated electric and natural gas utility primarily in Iowa and Illinois. After-tax earnings increased $65 million in 2021 compared to 2020. The increase reflected higher electric utility margin and increased income tax benefits, partly offset by higher operating expenses. The increase in operating expenses included incremental costs associated with wind-powered generating facilities placed in-service and higher natural gas distribution costs, partially offset by lower storm restoration costs. The income tax benefit increases were mainly due to higher production tax credits recognized on new wind-powered generating facilities placed in-service, partially offset by the impacts of ratemaking.

MEC electric utility margin increased $190 million to $2.0 billion in 2021 compared to 2020. The electric utility margin increase was attributable to higher operating revenue from increases in retail and wholesale customer volumes, as well as favorable wholesale prices, partially offset by higher thermal generation and purchased power costs. Electric retail customer volumes increased 5.8% in 2021 as compared to 2020, primarily due to increased usage by certain industrial customers and the favorable impacts of weather.

NV Energy operates regulated electric and natural gas utilities in Nevada. After-tax earnings increased $29 million in 2021 compared to 2020. The increase reflected lower operating expenses, lower net interest and finance expense and lower income tax expense from the impacts of ratemaking, partially offset by lower electric utility margin. The decreases in operating expenses were mainly due to lower earnings sharing, partially offset by higher depreciation expense from additional assets placed in-service.

NV Energy's electric utility margin decreased $97 million to $1.6 billion in 2021 compared to 2020. The decrease was primarily due to revenue reductions from lower base tariff general rates in 2021 and a favorable regulatory decision in 2020, partially offset by a 3.3% increase in electric retail customer volumes. The increase in electric retail customer volumes was primarily due to an increase in the average number of customers, higher customer usage and the favorable impacts of weather.

Northern Powergrid's after-tax earnings increased $46 million in 2021 compared to 2020. The increase reflected higher tariff rates and units distributed, lower write-offs of gas exploration costs, lower pension expense and favorable foreign currency exchange rate movements in 2021, partially offset by the impact of increases in the United Kingdom corporate income tax rate. Earnings in 2021 included deferred income tax expense of $109 million related to the enactment in June 2021 of an increase in the income tax rate from 19% to 25%, effective April 1, 2023. Earnings in 2020 included deferred income tax expense of $35 million related to the enactment in July 2020 of an increase in the income tax rate from 17% to 19%, effective April 1, 2020.

Natural gas pipelines' after-tax earnings increased $246 million in 2021 compared to 2020. Earnings in 2021 included BHE GT&S for the full year compared to two months in 2020. The incremental earnings in 2021 from BHE GT&S were $211 million. In addition, earnings in 2021 reflected the effects of higher margins on natural gas sales and higher transportation revenue at Northern Natural Gas due to increased demand from the February 2021 winter storms, partially offset by lower transportation revenue primarily due to lower volumes for the remainder of the year.

Other energy businesses' after-tax earnings in 2021 decreased $17 million compared to 2020. The decrease was mainly due to a decline in wind tax equity investment earnings of $56 million, which included increased losses from pre-existing tax equity investments of $165 million, largely attributable to the February 2021 winter storms, partially offset by increased income tax benefits from projects reaching commercial operation over the past twelve months. Earnings in 2021 from other energy projects increased due to higher operating revenue from owned renewable energy projects and a transmission investment, as well as favorable foreign currency exchange rate movements in 2021.

Real estate brokerage after-tax earnings increased $12 million in 2021 compared to 2020. The increase was due to a comparative increase in closed brokerage transaction volumes in 2021, partially offset by lower funded mortgage volume due to a decrease in refinance activity.

Corporate interest and other after-tax earnings increased $15 million in 2021 compared to 2020. The increase was primarily due to favorable comparative state income tax benefits and higher earnings from non-regulated energy services, offset by higher operating expenses and higher interest expense from corporate debt issued in 2020.

Utilities and Energy *(Continued)*

2020 versus 2019

PacifiCorp after-tax earnings decreased $32 million in 2020 compared to 2019. The decrease reflected higher operating expenses and net interest expense, partially offset by increased production tax credit benefits driven by repowered wind projects placed in-service, higher utility margin and higher other income. The increase in operating expenses was largely due to costs associated with wildfires, a settlement agreement and pension benefits.

PacifiCorp utility margin was $3.3 billion in 2020, an increase of $47 million compared to 2019. The increase reflected higher operating revenue from an increase in average retail prices and lower generation and purchased power costs, partially offset by lower operating revenue from a decline in retail customer volumes. The decline in retail customer volumes was due to the impacts of the pandemic, partly offset by an increase in the average number of customers and the favorable impacts of weather.

MEC after-tax earnings increased $37 million in 2020 compared to 2019. The increase reflected increased income tax benefits, primarily from production tax credits, driven by repowered and new wind projects placed in-service, and the effects of ratemaking. These effects were partially offset by higher depreciation expense from additional assets placed in-service, higher net interest expense, lower other income and lower electric and natural gas utility margins.

MEC electric utility margin decreased $10 million to $1.8 billion in 2020 compared to 2019. The electric utility margin decrease was attributable to lower operating revenue from unfavorable wholesale prices and price impacts from changes in retail sales mix. These effects were mostly offset by lower generation and purchased power costs and higher operating revenue from a 1.2% increase in retail customer volumes. The increase in electric retail customer volumes was primarily due to increased usage by certain industrial customers, partially offset by the impacts of the pandemic. Natural gas utility margin decreased $9 million in 2020 compared to 2019, due to the unfavorable impacts of weather.

NV Energy after-tax earnings increased $45 million in 2020 compared to 2019. The increase reflected higher electric utility margin and lower income tax expense from the favorable impacts of ratemaking, partially offset by higher operating expenses. The increase in operating expenses was mainly due to higher earnings sharing accruals for customers at Nevada Power Company and higher depreciation expense from additional assets placed in-service.

NV Energy electric utility margin increased $100 million to $1.7 billion in 2020 compared to 2019. The increase was primarily due to higher operating revenue from a 1.5% increase in electric retail customer volumes, including distribution-only service customers and price impacts from changes in retail sales mix. The increase in electric retail customer volumes was primarily due to the favorable impacts of weather, partially offset by the impacts of the pandemic.

Northern Powergrid after-tax earnings decreased $55 million in 2020 compared to 2019. The earnings decrease reflected write-offs of gas exploration costs and higher income tax expense, in large part from a change in the United Kingdom corporate income tax rate, partially offset by lower pension costs and interest expense.

Natural gas pipelines after-tax earnings increased $106 million in 2020 compared to 2019. The increase was primarily due to $73 million of earnings from BHE GT&S, the favorable impact of a rate case settlement at Northern Natural Gas and higher transportation volume and rates, partially offset by higher depreciation, operating expenses and interest expenses.

Other energy business after-tax earnings in 2020 increased $89 million compared to 2019. The increase was primarily due to increased income tax benefits from renewable wind tax equity investments, largely from projects reaching commercial operation, partially offset by lower operating revenue and higher operating expenses from geothermal and natural gas units.

Real estate brokerage after-tax earnings increased $215 million in 2020 compared to 2019. The increase reflected higher earnings from mortgage and brokerage services. The increase in earnings from mortgage services was attributable to higher refinance activity from the favorable interest rate environment and the earnings increase from brokerage services was due to an increase of 13.1% in closed transaction dollar volume.

Corporate interest and other after-tax earnings decreased $113 million in 2020 compared to 2019. The decline was primarily due to higher interest expense and lower state income tax benefits.

Manufacturing, Service and Retailing

A summary of revenues and earnings of our manufacturing, service and retailing businesses follows (dollars in millions).

	2021	2020	2019	Percentage change 2021 vs 2020	Percentage change 2020 vs 2019
Revenues					
Manufacturing	$ 68,730	$ 59,079	$ 62,730	16.3%	(5.8)%
Service and retailing	84,282	75,018	79,945	12.3	(6.2)
	$ 153,012	$ 134,097	$ 142,675	14.1	(6.0)
Pre-tax earnings					
Manufacturing	$ 9,841	$ 8,010	$ 9,522	22.9%	(15.9)%
Service and retailing	4,711	2,879	2,843	63.6	1.3
	14,552	10,889	12,365	33.6	(11.9)
Income taxes and noncontrolling interests	3,432	2,589	2,993		
Net earnings*	$ 11,120	$ 8,300	$ 9,372		
Effective income tax rate	23.0%	23.3%	23.7%		
Pre-tax earnings as a percentage of revenues	9.5%	8.1%	8.7%		

* *Excludes certain acquisition accounting expenses, which primarily related to the amortization of identified intangible assets recorded in connection with our business acquisitions. The after-tax acquisition accounting expenses excluded from earnings above were $690 million in 2021, $783 million in 2020 and $788 million in 2019. In 2020, net earnings also excluded after-tax goodwill and indefinite-lived intangible asset impairment charges of $10.4 billion. These expenses are included in "Other" in the summary of earnings on page K-32 and in the "Other Berkshire corporate" earnings section on page K-56.*

Manufacturing

Our manufacturing group includes a variety of industrial, building and consumer products businesses. A summary of revenues and pre-tax earnings of our manufacturing operations follows (dollars in millions).

	2021	2020	2019	Percentage change 2021 vs 2020	Percentage change 2020 vs 2019
Revenues					
Industrial products	$ 28,176	$ 25,667	$ 30,594	9.8%	(16.1)%
Building products	24,974	21,244	20,327	17.6	4.5
Consumer products	15,580	12,168	11,809	28.0	3.0
	$ 68,730	$ 59,079	$ 62,730		
Pretax earnings					
Industrial products	$ 4,469	$ 3,755	$ 5,635	19.0%	(33.4)%
Building products	3,390	2,858	2,636	18.6	8.4
Consumer products	1,982	1,397	1,251	41.9	11.7
	$ 9,841	$ 8,010	$ 9,522		
Pre-tax earnings as a percentage of revenues					
Industrial products	15.9%	14.6%	18.4%		
Building products	13.6%	13.5%	13.0%		
Consumer products	12.7%	11.5%	10.6%		

Manufacturing, Service and Retailing *(Continued)*

Industrial products

The industrial products group includes metal products for aerospace, power and general industrial markets (Precision Castparts Corp. ("PCC")), specialty chemicals (The Lubrizol Corporation ("Lubrizol")), metal cutting tools/systems (IMC International Metalworking Companies ("IMC")), and Marmon, which consists of more than 100 autonomous manufacturing and service businesses, internally aggregated into eleven groups, and includes equipment leasing for the rail, intermodal tank container and mobile crane industries. The industrial products group also includes equipment and systems for the livestock and agricultural industries (CTB International) and a variety of industrial products for diverse markets (Scott Fetzer and LiquidPower Specialty Products).

2021 versus 2020

Revenues of the industrial products group in 2021 increased $2.5 billion (9.8%) from 2020. Pre-tax earnings increased $714 million (19.0%) compared to 2020 and pre-tax earnings as a percentage of revenues in 2021 was 15.9%, an increase of 1.3 percentage points compared 2020.

PCC's revenues were $6.5 billion in 2021, a decrease of $853 million (11.6%) compared to 2020. Historically, PCC has derived significant revenues and earnings from aerospace products. The COVID-19 pandemic contributed to material declines in commercial air travel and original equipment manufacturing ("OEM") aircraft production in 2021 and 2020. While commercial air travel increased in both the U.S. and international markets in 2021 versus 2020, demand remains well below pre-pandemic levels, especially for international routes. Long-term industry forecasts continue to show growth and strong demand for travel, however, the recovery has been uneven between domestic and international markets. Air traffic recovery will continue to be impacted by the pandemic, though likely more on a seasonal or localized basis as the pandemic shifts to an endemic phase. Near term recovery in build rates will lag recovery in air travel due to the significant finished goods inventory following quality issues with the Boeing 737 and Boeing 787 planes and industry supply chain issues.

PCC's pre-tax earnings in 2021 were $1.2 billion, an increase of 78.8% compared to 2020. The increase reflects the actions taken by management to resize, restructure and improve operations and to prepare for more normalized demand for PCC's products, as well as from a decline in restructuring costs. We do not expect significant increases in PCC's aerospace revenues or earnings to occur in the near term, primarily due to the relatively low aircraft build rates related to Boeing's significant inventory levels and the ongoing impact of the COVID-19 pandemic on commercial air travel.

Lubrizol's revenues were $6.5 billion in 2021, an increase of 8.6% compared to 2020. The increase reflects higher average selling prices, driven by significant increases in materials and other manufacturing costs, as well as slightly higher volumes. Sales volumes in the Additives product lines were negatively affected by severe winter storms in February 2021, which caused the temporary shut-down of several U.S. facilities, as well as other temporary production shut-downs in the second half of 2021.

Lubrizol's pre-tax earnings in 2021 decreased 50.8% compared to 2020. Earnings in 2021 included significant losses related to a fire in June 2021 at a facility of Chemtool Incorporated, a Lubrizol subsidiary, located in Rockton, Illinois and impairment charges in the second half of 2021 related to an underperforming business in the Advanced Materials product lines. These losses and charges aggregated $257 million in 2021. Earnings in 2021 were also negatively impacted by the effects of accelerating raw material costs and the previously mentioned temporary shut-down of Additives production facilities, which resulted in lost sales and incremental manufacturing costs.

Marmon's revenues were $9.8 billion in 2021, an increase of $2.1 billion (27.9%) compared to 2020. Revenues in 2021 from the Electrical, Metal Services and Plumbing & Refrigeration groups increased 54% over 2020, accounting for over half of the aggregate increase in Marmon's revenues. These increases were attributable to higher volumes and prices, including the impact of significantly higher average copper and metal prices. Revenues of most of Marmon's other groups, particularly those serving the construction, automotive, heavy-duty truck and restaurant markets, also increased in 2021, reflecting higher volumes and favorable foreign currency translation effects. These increases were partially offset by the impact of divestitures and business closures in the Water Technologies and Retail Solutions groups and lower lease revenues in the Rail & Leasing group, reflecting fewer railcars on lease and changes in lease mix.

Marmon's pre-tax earnings in 2021 increased 40.3% compared to 2020. The increase was primarily due to earnings increases in the Electrical, Metal Services and Plumbing & Refrigeration groups due to higher volumes and average margins. Earnings of several other business groups also increased attributable to higher sales volumes, sales mix changes and lower restructuring charges, which were partially offset by lower earnings from the Rail & Leasing and Water Technologies groups.

Manufacturing, Service and Retailing *(Continued)*

Industrial products (Continued)

IMC's revenues increased 19.5% in 2021 compared to 2020, reflecting improving business conditions in most geographic regions and favorable foreign currency translation effects. IMC's pre-tax earnings increased 47.7% in 2021 versus 2020, primarily attributable to higher customer demand, improved manufacturing efficiencies, operating cost management saving initiatives and favorable foreign currency translation effects.

2020 versus 2019

Revenues of the industrial products group in 2020 declined $4.9 billion (16.1%) from 2019, while pre-tax earnings declined $1.9 billion (33.4%). Pre-tax earnings as a percentage of revenues for the group was 14.6% in 2020 compared to 18.4% in 2019.

PCC's revenues were $7.3 billion in 2020, a decrease of $3.0 billion (28.9%) compared to 2019. The COVID-19 pandemic contributed to material declines in commercial air travel and aircraft production. Airlines responded to the pandemic by delaying delivery of aircraft orders or, in some cases, cancelling aircraft orders, resulting in significant reductions in build rates by aircraft manufacturers and significant inventory reduction initiatives by PCC's customers. Further, Boeing's 737 MAX aircraft production issues contributed to the declines in aerospace product sales across the industry in 2020. These factors resulted in significant declines in demand for PCC's aerospace products in 2020. PCC's sales of products for power markets increased 2.2% in 2020, primarily driven by increases in industrial gas turbine products, offset by reductions in oil and gas products.

PCC's pre-tax earnings were $650 million in 2020, a decrease of 64.5% compared to 2019, which reflected the decline in aerospace product sales as well as increased manufacturing inefficiencies attributable to lower volumes. In response to the effects of the pandemic, PCC took aggressive restructuring actions to resize operations in response to reduced expected volumes in aerospace markets. PCC's worldwide workforce was reduced by about 40% from the end of 2019. PCC recorded restructuring, inventory and fixed asset charges of approximately $295 million in 2020. Earnings as a percentage of revenues were negatively impacted in 2020 due to inefficiencies associated with aligning operations to reduced aircraft build rates.

Lubrizol's revenues were $5.95 billion in 2020, a decrease of 8.0% compared to 2019. The decline was primarily attributable to lower volumes from economic effects of the pandemic and a fire at an Additives manufacturing, blending and storage facility in Rouen, France at the end of the third quarter of 2019, which resulted in the temporary suspension of operations. Revenues in 2020 also reflected lower selling prices, partly offset by favorable changes in sales mix. Lubrizol's consolidated volume for the year declined 9% in 2020 compared to 2019 due to declines in the Additives and Engineered Materials product lines, partly offset by higher volumes in Life Science products.

Lubrizol's pre-tax earnings in 2020 were approximately $1.0 billion, essentially unchanged compared to 2019. The effects of lower sales volumes, including the effects from the Rouen fire, and lower average selling prices were offset by lower average raw material costs, lower operating expenses and insurance recoveries in 2020 associated with the Rouen fire.

Marmon's revenues were $7.6 billion in 2020, a decrease of $681 million (8.2%) compared to 2019. Excluding the effects of business acquisitions, revenues decreased in essentially all groups, primarily attributable to lower demand from the effects of the pandemic. The largest effects were experienced in the Transportation Products and Foodservice Technologies groups. Additionally, revenues decreased due to lower metal prices in the Metal Services group and the effect of business divestitures in 2019. Declines in oil prices in 2020 also adversely affected demand and revenues in the Rail & Leasing and Crane Services groups. Marmon acquired the Colson Medical companies on October 31, 2019, which represents Marmon's Medical group.

Marmon's pre-tax earnings in 2020 decreased $312 million (24.3%) compared to 2019. The decrease reflected the declines in revenues and increased restructuring charges. Restructuring initiatives were initiated in response to the lower product demand, particularly in the sectors most impacted by the pandemic.

Manufacturing, Service and Retailing *(Continued)*

Industrial products (Continued)

IMC's revenues declined 13.2% in 2020 compared to 2019, reflecting negative economic effects from the pandemic on demand for cutting tools in most geographic regions, partly offset by the effects of business acquisitions. IMC's pre-tax earnings declined 26.6% in 2020 versus 2019, attributable to declines in sales and margins due to lower volumes and to changes in sales mix.

Building products

The building products group includes manufactured and site-built home construction and related lending and financial services (Clayton Homes), flooring (Shaw), insulation, roofing and engineered products (Johns Manville), bricks and masonry products (Acme Building Brands), paint and coatings (Benjamin Moore) and residential and commercial construction and engineering products and systems (MiTek).

2021 versus 2020

Revenues of the building products group increased $3.7 billion (17.6%) in 2021 and pre-tax earnings increased $532 million (18.6%) compared to 2020. Pre-tax earnings as percentages of revenues were 13.6% in 2021 and 13.5% in 2020. During 2021, our businesses experienced strong customer demand and higher sales volumes. We also experienced various forms of supply chain disruptions, which affected the general economy, and contributed to considerable raw material and logistics cost inflation and supply constraints.

Clayton Homes' revenues were approximately $10.5 billion in 2021, an increase of $1.9 billion (22.2%) over 2020. Revenues from home sales increased $1.8 billion (26.5%) in 2021 to approximately $8.3 billion, reflecting increased revenue per home sold, changes in sales mix and a net increase in new units sold. Unit sales of site-built homes increased 15.8% in 2021, while factory-built manufactured home unit sales increased 1.5%. Site-built home unit sales were constrained by longer construction periods arising from supply chain constraints and labor shortages. Financial services revenues, which include mortgage origination and services, insurance and interest income from lending activities, increased 7.8% in 2021 compared to 2020. Loan balances, net of allowances for credit losses, were approximately $18.8 billion as of December 31, 2021, an increase of approximately $1.7 billion compared to December 31, 2020.

Pre-tax earnings of Clayton Homes were approximately $1.7 billion in 2021, an increase of $440 million (35.3%) compared to 2020. Earnings in 2021 reflected higher earnings from home sales, mortgage originations, net interest income and lower provisions for expected credit losses, partially offset by the impact of rising manufacturing and supply chain costs. The provision for expected credit losses in 2020 was unusually high and included provisions for the expected impact of the COVID-19 pandemic. The comparative decline in the provision for expected credit losses was due to fewer actual and anticipated loan foreclosures.

Aggregate revenues of our other building products businesses were approximately $14.5 billion in 2021, an increase of 14.4% versus 2020. The increase was primarily due to higher average selling prices driven by significantly higher input and supply chain costs, as well as higher unit volumes for paint and coatings, flooring, insulation, roofing and other engineered products.

Pre-tax earnings of the other building products businesses were approximately $1.7 billion in 2021, an increase of 5.7% over 2020. Pre-tax earnings as a percentage of revenues was 11.8% in 2021, a 1.0 percentage point decrease compared to 2020. While customer demand in 2021 was generally strong, reduced availability of materials and other product inputs from supply chain disruptions negatively affected sales and operating results. In addition, higher costs for raw materials and freight and higher restructuring and impairment charges contributed to the reduction in our pre-tax margin rates.

2020 versus 2019

Revenues of the building products group increased $917 million (4.5%) in 2020 compared to 2019 and pre-tax earnings increased $222 million (8.4%) over 2019. Pre-tax earnings as percentages of revenues were 13.5% in 2020 and 13.0% in 2019.

Manufacturing, Service and Retailing *(Continued)*

Building products (Continued)

Clayton Homes' revenues were approximately $8.6 billion in 2020, an increase of $1.3 billion (17.1%) over 2019. The increase was primarily due to increases in home sales of $1.0 billion (18.4%), driven by increases in units sold and revenue per home sold and by changes in sales mix. Unit sales of site-built homes increased 28.6% in 2020 over 2019, while revenue per home increased slightly. Manufactured home unit sales increased 2.8% in 2020. Financial services revenues increased 13.7% in 2020 compared to 2019, attributable to increased loan originations and average outstanding loan balances. Loan balances, net of allowances for credit losses, were approximately $17.1 billion at December 31, 2020 compared to $15.9 billion as of December 31, 2019.

Pre-tax earnings of Clayton Homes were approximately $1.25 billion in 2020, an increase of $152 million (13.9%) compared to 2019. The earnings increase reflected higher earnings from home sales, partly offset by higher materials costs, which lowered manufactured housing gross margin rates. Earnings in 2020 also benefitted from increased interest income, lower interest expense and higher earnings from mortgage services, partly offset by increased provisions for credit and insurance losses.

Aggregate revenues of our other building products businesses were approximately $12.6 billion in 2020, a decrease of 2.6% versus 2019. The revenue decrease reflected lower flooring volumes, in part attributable to the negative effects of the COVID-19 pandemic, partially offset by increased paint and coatings volumes, including volumes from a new agreement with Ace Hardware Stores, and increased volumes in residential markets.

Pre-tax earnings of the other building products businesses were approximately $1.6 billion in 2020, an increase of 4.6% over 2019. The earnings increase reflected the effects of lower average input costs, operating cost containment efforts and lower facilities closure costs.

Consumer products

The consumer products group includes leisure vehicles (Forest River), several apparel and footwear operations (including Fruit of the Loom, Garan, H.H. Brown Shoe Group and Brooks Sports) and a manufacturer of high-performance alkaline batteries (Duracell). This group also includes custom picture framing products (Larson-Juhl) and jewelry products (Richline).

2021 versus 2020

Consumer products revenues increased $3.4 billion (28.0%) in 2021 versus 2020. Revenues from Forest River increased 40.2% in 2021 compared to 2020, driven by a 27.6% increase in recreational vehicle unit sales and higher average selling prices, primarily due to significant increases in manufacturing costs.

Revenues of several of our other consumer products businesses were significantly higher in 2021 as compared to 2020. The initial impacts of the pandemic in the first half of 2020 from temporary retail store closures and reduced demand had a severe impact on most of these businesses. Apparel and footwear revenues increased 25.3% in 2021 compared to 2020, reflecting significant increases in unit sales, partly attributable to inventory restocking by certain customers, and from increased consumer demand. Revenues from Richline increased 39.9%, while revenues from Duracell increased 2.4%.

Consumer products pre-tax earnings increased $585 million (41.9%) in 2021 compared to 2020 and as a percentage of revenues in 2021 increased 1.2 percentage points to 12.7%. The increase reflected significant earnings increases at many of our businesses, driven by Forest River, the apparel and footwear businesses, Richline and Larson-Juhl. However, our consumer products businesses, particularly the apparel and footwear businesses, also experienced significant cost increases and supply chain disruptions, causing pre-tax margins in the second half of 2021 to be 1.1 percentage points lower than in the first half of the year.

2020 versus 2019

Consumer products revenues increased $359 million (3.0%) in 2020 versus 2019, while pre-tax earnings increased $146 million (11.7%). Pre-tax earnings as a percentage of revenues in 2020 increased 0.9 percentage points to 11.5%.

Manufacturing, Service and Retailing *(Continued)*

Consumer products (Continued)

The comparative increase in revenues reflected increases from Forest River and Duracell, partially offset by lower apparel and footwear revenues. Forest River revenues increased 11.7% in 2020 compared to 2019, primarily attributable to a significant increase in recreational vehicle unit sales over the last half of the year and changes in sales mix. Unit sales in the second half of 2020 increased 31% over the second half of 2019. Revenues from Duracell increased 10.0% in 2020 compared to 2019, reflecting the effects of changes in sales mix and increased volume. Apparel and footwear revenues declined 6.1% in 2020 compared to 2019.

Apparel and footwear sales volumes in the first half of 2020, particularly in the second quarter, reflected the negative effects of the pandemic, which included retail store closures, reduced or cancelled orders and pandemic-related disruptions at certain manufacturing facilities. Sales recovered somewhat in the second half of 2020, attributable to higher consumer demand and inventory restocking by retailers. Brooks Sports revenues were higher, partly attributable to the effect of the reduced sales in 2019 that were caused by shipping delays at a new distribution facility.

Pre-tax earnings were $1.4 billion in 2020, an increase of $146 million (11.7%) compared to 2019. The increase was primarily attributable to Forest River and Duracell, partially offset by lower earnings from apparel and footwear. The overall increase reflected the effects of sales volumes changes and ongoing expense management efforts.

Service and retailing

A summary of revenues and pre-tax earnings of our service and retailing businesses follows (dollars in millions).

				Percentage change	
	2021	**2020**	**2019**	**2021 vs 2020**	**2020 vs 2019**
Revenues					
Service	$ 15,872	$ 12,346	$ 13,496	28.6%	(8.5)%
Retailing	18,960	15,832	15,991	19.8	(1.0)
McLane	49,450	46,840	50,458	5.6	(7.2)
	$ 84,282	$ 75,018	$ 79,945		
Pre-tax earnings					
Service	$ 2,672	$ 1,600	$ 1,681	67.0%	(4.8)%
Retailing	1,809	1,028	874	76.0	17.6
McLane	230	251	288	(8.4)	(12.8)
	$ 4,711	$ 2,879	$ 2,843		
Pre-tax earnings as a percentage of revenues					
Service	16.8%	13.0%	12.5%		
Retailing	9.5%	6.5%	5.5%		
McLane	0.5%	0.5%	0.6%		

Service

Our service group consists of several businesses. The largest of these businesses are NetJets and FlightSafety (aviation services), which offer shared ownership programs for general aviation aircraft and high technology training products and services to operators of aircraft, and TTI, a distributor of electronics components. Our other service businesses franchise and service a network of quick service restaurants (Dairy Queen), lease transportation equipment (XTRA) and furniture (CORT), provide third party logistics services that primarily serve the petroleum and chemical industries (Charter Brokerage), distribute electronic news, multimedia and regulatory filings (Business Wire) and operate a television station in Miami, Florida (WPLG).

Manufacturing, Service and Retailing *(Continued)*

Service (Continued)

2021 versus 2020

Service group revenues increased $3.5 billion (28.6%) in 2021 compared to 2020, primarily attributable to higher revenues from TTI and the aviation services businesses. Revenues from TTI increased 37.4% in 2021 versus 2020, primarily attributable to significantly higher volumes across all significant markets and product categories, and to a lesser extent, higher average prices and changes in sales mix. Customer demand accelerated throughout 2021, as customers attempted to maintain adequate inventories in response to high demand for components in end products and effects of supply chain disruptions. Revenues from aviation services increased 27.5% in 2021 over low 2020 levels, primarily due to higher training hours (24%) and customer flight hours (70%).

Pre-tax earnings of our service business group increased $1.1 billion (67.0%) to $2.7 billion. Pre-tax earnings of the group as a percentage of revenues were 16.8% in 2021, an increase of 3.8 percentage points compared to 2020. Earnings at nearly all service businesses increased in 2021 compared to 2020, with the largest increases from TTI, the aviation services businesses and the XTRA leasing business. TTI's earnings increase was primarily attributable to the increases in sales volumes, as well as from improved operating cost leverage and changes in sales mix. The increase in earnings from aviation services was attributable to the favorable effects of higher volume, changes in business mix, increased operating efficiencies, lower impairment charges and the effects of past restructuring efforts, partly offset by higher subcontractor costs attributable to the significant increase in flight demand.

2020 versus 2019

Service group revenues declined $1.15 billion (8.5%) in 2020 compared to 2019 and pre-tax earnings decreased $81 million (4.8%). Pre-tax earnings of the group as a percentage of revenues were 13.0% in 2020, an increase of 0.5 percentage points compared to 2019.

The aggregate revenues of NetJets and FlightSafety in 2020 declined $816 million (13.5%) compared to 2019, reflecting lower demand for air travel and aviation services attributable to the COVID-19 pandemic. NetJets experienced a decline in customer flight hours of 27% and FlightSafety's commercial and corporate simulator training hours declined 30% from 2019. The comparative service group revenue decline also reflected the disposition of the newspaper operations in March of 2020 and lower revenues from CORT, which was driven by lower demand attributable to the pandemic. These declines were partially offset by revenue increases from TTI and WPLG.

The decline in earnings reflected lower earnings from NetJets, TTI and CORT and the divestiture of the newspaper operations, partly offset by higher earnings from XTRA, Business Wire, WPLG and FlightSafety. TTI's earnings decline reflected lower average gross margin rates, attributable to product mix changes and sales price pressures deriving from ample inventory availability. The decline at NetJets was primarily attributable to increased asset impairment charges and restructuring costs, partly offset by lower general and administrative expenses and a slight net increase in margins. The decline at CORT was driven by lower revenues, partly offset by the effects of cost control initiatives. The increase at FlightSafety was attributable to the effects of contract losses of approximately $165 million recorded in 2019 with respect to an existing government contract and cost control efforts in 2020, which more than offset significantly lower earnings from commercial and corporate training services.

Retailing

Our largest retailing business is Berkshire Hathaway Automotive, Inc. ("BHA"), representing 62% of our combined retailing revenue in 2021. BHA consists of over 80 auto dealerships that sell new and pre-owned automobiles and offer repair services and related products. BHA also operates two insurance businesses, two auto auctions and an automotive fluid maintenance products distributor. Our retailing businesses also include four home furnishings retailing businesses (Nebraska Furniture Mart, R.C. Willey, Star Furniture and Jordan's), which sell furniture, appliances, flooring and electronics. The home furnishings group represented 21% of the combined retailing revenues in 2021.

Other retailing businesses include three jewelry retailing businesses (Borsheims, Helzberg and Ben Bridge), See's Candies (confectionary products), Pampered Chef (high quality kitchen tools), Oriental Trading Company (party supplies, school supplies and toys and novelties) and Detlev Louis Motorrad ("Louis"), a retailer of motorcycle accessories based in Germany.

Manufacturing, Service and Retailing *(Continued)*

Retailing (Continued)

2021 versus 2020

Retailing group revenues in 2021 increased $3.1 billion (19.8%) compared to 2020. BHA's revenues increased 19.0% in 2021 compared to 2020, with vehicle sales, service and repair, and finance and service contract revenues each increasing versus 2020. Revenues from vehicle sales in 2021 increased $1.7 billion (20.7%) versus 2020, primarily due to higher average selling prices, as well as a 2.7% increase in units sold. However, new vehicle unit sales in the second half of 2021 declined 18% compared to the second half of 2020, reflecting significant new vehicle supply shortages at OEMs attributable to the global computer chip shortages and other supply chain disruptions. Home furnishings group revenues increased 22.0% in 2021 as compared to 2020, attributable to higher consumer demand and higher average selling prices, driven by higher inventory and freight costs.

Pre-tax earnings in 2021 of the retailing group increased $781 million (76.0%) from 2020 and the pre-tax margin rate increased 3.0 percentage points to 9.5%. BHA's pre-tax earnings increased 47.5% in 2021 compared to 2020, primarily due to increased vehicle sales margins and higher earnings from finance and service contract activities. In addition, earnings in 2021 benefitted from lower floorplan interest expense, attributable to significant declines in inventory levels, and from ongoing operating cost control efforts.

Home furnishings group pre-tax earnings increased 67.6% in 2021 versus 2020, reflecting generally higher average gross margin rates and sales mix changes and cost control efforts, partly offset by higher personnel costs. Aggregate pre-tax earnings for the remainder of our retailing group increased $321 million in 2021 compared to 2020. The initial effects of the pandemic in 2020 were severe for most of our other retailers due to the restricted operations at many of those businesses. Results in 2021 also benefitted from relatively strong consumer demand and the effects of restructuring efforts in 2020.

2020 versus 2019

Retailing group revenues in 2020 declined $159 million (1.0%) compared to 2019. The spread of COVID-19 resulted in the temporary closures or restricted operations at several of our retailing businesses and effected consumer spending patterns during 2020. The severity and duration of the effects from the pandemic varied widely at our retail operations.

BHA's revenues decreased 2.9% in 2020 compared to 2019. BHA's revenues in 2020 reflected decreases in new and pre-owned vehicle sales of 2.6%, as well as lower vehicle service and repair revenues. Home furnishings revenues were essentially unchanged in 2020 compared to 2019. The retailing group experienced lower revenues in the first half of 2020, attributable to restricted store hours, which were substantially offset by increased revenues over the second half of the year. However, supply chain disruptions had a negative effect on obtaining product at certain times, which negatively affected sales levels.

The effects of the pandemic contributed to significantly lower sales in 2020 for our jewelry stores, See's Candies and Oriental Trading Company, which were more than offset by significant revenue increases from Pampered Chef and Louis. Sales volumes generally increased and operating results improved beginning in the latter part of the second quarter as our operations slowly reopened.

Retail group pre-tax earnings increased $154 million (17.6%) in 2020 from 2019. BHA's pre-tax earnings increased 37.7%, primarily due to lower selling, general and administrative expenses, lower floorplan interest expense and higher average gross sales margin rates. Aggregate pre-tax earnings for the remainder of our retailing group increased 1.1% in 2020 compared to 2019, reflecting higher earnings from the home furnishings businesses and from Pampered Chef, which were substantially offset by lower earnings from our other retailing operations.

Home furnishings group pre-tax earnings increased $79 million (36%) in 2020 versus 2019, reflecting generally higher average gross margin rates, sales mix changes and fewer sales promotions and lower advertising and other operating expenses. Certain of our other operations, including Pampered Chef and Louis experienced significant earnings increases in 2020, while others, including See's Candies and Oriental Trading Company, experienced significant declines driven by the negative effects of the pandemic.

Manufacturing, Service and Retailing *(Continued)*

Retailing (Continued)

McLane

McLane Company, Inc. ("McLane") operates a wholesale distribution business that provides grocery and non-food consumer products to retailers and convenience stores ("grocery") and to restaurants ("foodservice"). McLane also operates businesses that are wholesale distributors of distilled spirits, wine and beer ("beverage"). The grocery and foodservice businesses generate high sales and very low profit margins. These businesses have several significant customers, including Walmart, 7-Eleven, Yum! Brands and others. Grocery sales comprised about 63% of McLane's consolidated sales in 2021 with food service comprising most of the remainder. A curtailment of purchasing by any of its significant customers could have an adverse impact on periodic revenues and earnings.

2021 versus 2020

Revenues increased $2.6 billion (5.6%) in 2021 compared to 2020. Revenues from the grocery business increased 1.5% compared to 2020, while revenues from the foodservice and beverage businesses increased 13.1% and 17.8%, respectively. The foodservice business was significantly impacted by pandemic-related restaurant closures in 2020.

Pre-tax earnings decreased $21 million (8.4%) in 2021 as compared to 2020. The decrease reflected significant increases in personnel, contract transportation and fuel costs, which more than offset the favorable impact of higher sales and slightly higher gross sales margins. McLane's grocery and food service operations were significantly affected in 2021 by upstream supply chain constraints, including the effects of labor and truck driver shortages, which contributed to higher inventory costs reflected in a LIFO inventory reserve increase of $130 million, and disruptions in inventory availability. These upstream supply chain effects, together with the truck driver and warehouse personnel shortages that we are experiencing, adversely affected our customer service levels and reduced our operating efficiencies. In response, our hiring and wage and benefits costs increased significantly in 2021. The increase in fuel expense was primarily attributable to significant increases in petroleum prices. We expect the current difficult operating environment to continue through 2022.

2020 versus 2019

Revenues declined $3.6 billion (7.2%) in 2020 compared to 2019. The decline was attributable to COVID-19-related restaurant closures (particularly in the casual dining category) in the foodservice business and lower sales in certain product categories within the grocery business. McLane operates on a 52/53-week fiscal year and 2020 included 52 weeks compared to 53 weeks in 2019. Otherwise, revenues declined 5.2% in the grocery business and 7.7% in the foodservice business in 2020 as compared to 2019.

Pre-tax earnings decreased $37 million (12.8%) in 2020 as compared to 2019. The earnings decrease included the effects of increased LIFO inventory reserves of $22 million, credit and inventory losses of $12 million in the foodservice operations and the impact of lower sales.

Investment and Derivative Contract Gains/Losses

A summary of investment and derivative contract gains/losses follows (dollars in millions).

	2021	2020	2019
Investment gains/losses	$ 77,576	$ 40,905	$ 71,123
Derivative contract gains/losses	966	(159)	1,484
Gains/losses before income taxes and noncontrolling interests	78,542	40,746	72,607
Income taxes and noncontrolling interests	16,202	9,155	15,162
Net earnings	$ 62,340	$ 31,591	$ 57,445
Effective income tax rate	20.4%	21.7%	20.9%

Investment and Derivative Contract Gains/Losses *(Continued)*

Investment gains/losses

Unrealized gains and losses arising from changes in market prices of our investments in equity securities are included in our reported earnings, which significantly increases the volatility of our periodic net earnings due to the magnitude of our equity securities portfolio and the inherent volatility of equity securities prices. Pre-tax investment gains/losses included net unrealized gains of approximately $76.4 billion in 2021, $55.0 billion in 2020 and $69.6 billion in 2019 attributable to changes in market prices of equity securities we held at the end of each year. In each year, we also recorded pre-tax gains and losses from market value changes during each year on equity securities sold during such year, including gains of $1.0 billion in 2021, losses of $14.0 billion in 2020 and gains of $1.6 billion in 2019. Taxable investment gains on equity securities sold, which is generally the difference between sales proceeds and the original cost basis of the securities sold, were $3.6 billion in 2021, $6.2 billion in 2020 and $3.2 billion in 2019.

We believe that investment gains/losses, whether realized from sales or unrealized from changes in market prices, are often meaningless in terms of understanding our periodic consolidated earnings or evaluating our periodic economic performance. We continue to believe the investment gains/losses recorded in earnings, including the changes in market prices for equity securities, in any given period has little analytical or predictive value.

Derivative contract gains/losses

Derivative contract gains/losses include the changes in fair value of our equity index put option contract liabilities, which relate to contracts that were originated prior to March 2008. A vast majority of these contracts have since expired. Contracts comprising 63% of the remaining notional value as of December 31, 2021 will expire in the first quarter of 2022. The periodic changes in the fair values of these liabilities are recorded in earnings and, historically, were significant, primarily due to the volatility of underlying equity markets. As of December 31, 2021, the intrinsic value of our equity index put option contracts was near zero and our recorded liability at fair value was approximately $99 million. Our ultimate payment obligations, if any, under our contracts will be determined as of the contract expiration dates based on the intrinsic value as defined under the contracts. The pre-tax gains and losses in each of the past three years reflected changes in the equity index values and shorter remaining contract durations. Settlement payments to counterparties over the past three years were insignificant.

Other

A summary of after-tax other earnings/losses follows (in millions).

	2021	2020	2019
Equity method earnings	$ 881	$ 665	$ 1,023
Acquisition accounting expenses	(690)	(783)	(788)
Goodwill and intangible asset impairments	—	(10,381)	(96)
Corporate interest expense, before foreign currency effects	(305)	(334)	(280)
Foreign currency exchange rate gains (losses) on Berkshire and BHFC non-U.S. Dollar senior notes	955	(764)	58
Other Berkshire corporate	474	279	507
	$ 1,315	$ (11,318)	$ 424

After-tax equity method earnings include our proportionate share of earnings attributable to our investments in Kraft Heinz, Pilot, Berkadia, Electric Transmission of Texas and Iroquois Gas Transmission Systems. Our after-tax earnings from Kraft Heinz were $317 million in 2021, $170 million in 2020 and $488 million in 2019. Our earnings from Kraft Heinz included our after-tax share of goodwill and other intangible asset impairment charges recorded by Kraft Heinz in each year. Our after-tax share of such charges was $259 million in 2021, $611 million in 2020 and $339 million in 2019.

Other *(Continued)*

After-tax acquisition accounting expenses include charges arising from the application of the acquisition method in connection with certain of Berkshire's past business acquisitions. Such charges arise primarily from the amortization or impairment of intangible assets recorded in connection with those business acquisitions. Goodwill and intangible asset impairments in 2020 included after-tax charges of $9.8 billion attributable to impairments of goodwill and certain identifiable intangible assets that were recorded in connection with our acquisition of PCC in 2016. See Other Critical Accounting Policies on page K-62 for additional details.

Foreign currency exchange rate gains and losses pertain to Berkshire's Euro and Japanese Yen denominated debt and BHFC's Great Britain Pound denominated debt. Changes in foreign currency exchange rates produce unrealized gains and losses from the periodic revaluation of these liabilities into U.S. Dollars. The gains and losses recorded in any given period can be significant due to the magnitude of the borrowings and the inherent volatility in foreign currency exchange rates. Berkshire corporate items consist primarily of Berkshire parent company investment income and corporate expenses, other intercompany interest income where the interest expense is included in earnings of the operating businesses and unallocated income taxes.

Financial Condition

Our consolidated balance sheet continues to reflect very significant liquidity and a very strong capital base. Consolidated shareholders' equity at December 31, 2021 was $506.2 billion, an increase of $63.0 billion since December 31, 2020. Net earnings attributable to Berkshire shareholders was $89.8 billion and included after-tax gains on our investments of approximately $61.6 billion. Over each of the last three years, investment gains and losses from changes in the market prices of our investments in equity securities produced exceptional volatility in our periodic earnings.

Berkshire's common stock repurchase program, as amended, permits Berkshire to repurchase its Class A and Class B shares at prices below Berkshire's intrinsic value, as conservatively determined by Warren Buffett, Berkshire's Chairman of the Board and Chief Executive Officer, and Charlie Munger, Vice Chairman of the Board. The program does not specify a maximum number of shares to be repurchased and does not require any specified repurchase amount. The program is expected to continue indefinitely. We will not repurchase our stock if it reduces the total amount of Berkshire's consolidated cash, cash equivalents and U.S. Treasury Bill holdings below $30 billion. Financial strength and redundant liquidity will always be of paramount importance at Berkshire. Berkshire paid $27.1 billion in 2021 to repurchase shares of its Class A and B common stock.

At December 31, 2021, our insurance and other businesses held cash, cash equivalents and U.S. Treasury Bills of $143.9 billion, which included $119.6 billion in U.S. Treasury Bills. Investments in equity and fixed maturity securities (excluding our investment in Kraft Heinz) were $367.2 billion. Our fixed maturity securities at December 31, 2021 included approximately $14.4 billion of investments that mature in 2022 and 2023.

Our consolidated borrowings at December 31, 2021 were $114.3 billion, of which over 95% were by the Berkshire parent company, BHFC, BNSF and BHE and its subsidiaries. Expected principal and interest payments related to our consolidated borrowings in each of the next five years are (in billions): $10.2 in 2022; $14.6 in 2023; $9.7 in 2024; $9.9 in 2025; and $8.7 in 2026.

Berkshire parent company debt outstanding at December 31, 2021 was $21.4 billion, a decrease of $1.3 billion since December 31, 2020, which was primarily due to the effects of foreign currency exchange rate changes on Euro and Japanese Yen denominated debt. In 2021, Berkshire repaid Euro and U.S. Dollar denominated debt aggregating approximately $2.2 billion of maturing senior notes and issued Euro and Yen denominated senior notes aggregating approximately $2.2 billion with maturity dates ranging from 2026 to 2041 and a weighted average interest rate of 0.5%. In January 2022, Berkshire repaid $600 million of maturing senior notes and issued ¥128.5 billion (approximately $1.1 billion) of senior notes with maturity dates ranging from 2027 to 2052 and a weighted average interest rate of 0.5%.

Berkshire's insurance and other subsidiary outstanding borrowings were approximately $17.9 billion at December 31, 2021, which included senior note borrowings of BHFC, a wholly-owned financing subsidiary, of approximately $13.1 billion. BHFC's borrowings are used to fund a portion of loans originated and acquired by Clayton Homes and equipment held for lease by our railcar leasing business. In 2021, BHFC repaid $750 million of maturing senior notes and issued $750 million of 2.5% senior notes due in 2051. Berkshire guarantees BHFC's senior notes for the full and timely payment of principal and interest.

Financial Condition *(Continued)*

BNSF's outstanding debt was $23.2 billion as of December 31, 2021, relatively unchanged from December 31, 2020. During 2021, BNSF repaid $1.54 billion of debt and issued $1.55 billion of debentures with a weighted average interest rate of 3.1% with maturity dates in 2051 and 2052. Outstanding borrowings of BHE and its subsidiaries were $51.8 billion at December 31, 2021, a decrease of $382 million since December 31, 2020. In 2021, BHE and its subsidiaries issued new term debt of approximately $2.2 billion with maturity dates ranging from 2028 to 2052 and repaid term debt of approximately $2.5 billion. Berkshire does not guarantee the repayment of debt issued by BNSF, BHE or any of their subsidiaries.

In each of the past three years, our diverse group of businesses generated net operating cash flows of approximately $39 billion. Our consolidated capital expenditures for property, plant and equipment and equipment held for lease were $13.3 billion in 2021, which included capital expenditures by our railroad, utilities and energy businesses (BNSF and BHE) of $9.5 billion. BNSF and BHE maintain very large investments in capital assets (property, plant and equipment) and will regularly make significant capital expenditures in the normal course of business. We forecast capital expenditures of these two operations will approximate $11.1 billion in 2022.

Contractual Obligations

We are party to other contracts associated with ongoing business activities, which will result in cash payments to counterparties in future periods. Certain obligations are included in our Consolidated Balance Sheets, such as operating lease liabilities and shared aircraft repurchase liabilities of NetJets. Estimated payments of these liabilities in each of the next five years are (in billions): $1.6 in 2022; $1.5 in 2023; $1.4 in 2024; $1.2 in 2025; and $1.2 in 2026.

We are also obligated to pay claims arising from property and casualty insurance companies. Such liabilities, including amounts from retroactive reinsurance, were approximately $125 billion at December 31, 2021. We currently forecast claim payments in 2022 of approximately $29 billion with respect to claims occurring prior to 2022. Additionally, we estimate net payments of approximately $3 billion in 2022 for life, health and annuity benefits under contracts. However, the timing and amount of the payments under insurance and reinsurance contracts are contingent upon the outcome of future events. Actual payments will likely vary, perhaps materially, from the forecasted payments, as well as from the liabilities currently recorded in our Consolidated Balance Sheet. We anticipate that these payments will be funded by operating cash flows.

Other obligations pertaining to the acquisition of goods or services in the future, such as certain purchase obligations, are not currently reflected in the Consolidated Financial Statements and will be recognized in future periods as the goods are delivered or services are provided. As of December 31, 2021, the largest categories of our long-term contractual obligations primarily related to fuel, capacity, transmission and maintenance contracts and capital expenditure commitments of BHE and BNSF and aircraft purchase commitments of NetJets. We estimate future payments associated with these contracts over the next five years of approximately $19 billion, including $8 billion in 2022. We also have an agreement to acquire an additional 41.4% of Pilot in 2023 and agreements to acquire certain non-controlling interests of consolidated subsidiaries. Reference is made to Note 26 to the Consolidated Financial Statements for additional information regarding these commitments.

Critical Accounting Policies

Certain accounting policies require us to make estimates and judgments in determining the amounts reflected in our Consolidated Financial Statements. Such estimates and judgments necessarily involve varying and possibly significant degrees of uncertainty. Accordingly, certain amounts currently recorded in our Consolidated Financial Statements will likely be adjusted in the future based on new available information and changes in other facts and circumstances. A discussion of our principal accounting policies that required the application of significant judgments as of December 31, 2021 follows.

Property and casualty insurance unpaid losses

We record liabilities for unpaid losses and loss adjustment expenses (also referred to as "gross unpaid losses" or "claim liabilities") based upon estimates of the ultimate amounts payable for loss events occurring on or before the balance sheet date. The timing and amount of ultimate loss payments are contingent upon, among other things, the timing of claim reporting from insureds and ceding companies and the final determination of the loss amount through the loss adjustment and settlement process. We use a variety of techniques in establishing claim liabilities, which may require significant judgments and assumptions.

As of the balance sheet date, recorded claim liabilities include estimates for reported claims and for claims not yet reported. The period between the loss occurrence date and loss settlement date is the "claim-tail." Property claims usually have relatively short claim-tails, absent litigation. Casualty claims usually have longer claim-tails, occasionally extending for decades. Casualty claims may be more susceptible to litigation and the impact of changing contract interpretations. The legal environment and judicial process further contribute to extending claim-tails.

Property and casualty losses *(Continued)*

Our consolidated claim liabilities, including liabilities from retroactive reinsurance contracts, as of December 31, 2021 were approximately $125 billion, of which 80% related to GEICO and the Berkshire Hathaway Reinsurance Group. Additional information regarding significant uncertainties inherent in the processes and techniques for estimating unpaid losses of these businesses follows.

GEICO

GEICO predominantly writes private passenger auto insurance. As of December 31, 2021, GEICO's gross unpaid losses were $23.9 billion and claim liabilities, net of reinsurance recoverable, were $22.7 billion. GEICO's claim reserving methodologies produce liability estimates based upon the individual claims. The key assumptions affecting our liability estimates include projections of ultimate claim counts ("frequency") and average loss per claim ("severity"). We utilize a combination of several actuarial estimation methods, including Bornhuetter-Ferguson and chain-ladder methodologies.

Claim liability estimates for automobile liability coverages (such as bodily injury ("BI"), uninsured motorists, and personal injury protection) are more uncertain due to the longer claim-tails, so we establish additional case development estimates. As of December 31, 2021, case development liabilities averaged approximately 34% of the case reserves. We select case development factors through analysis of the overall adequacy of historical case liabilities.

Incurred-but-not-reported ("IBNR") claim liabilities are based on projections of the ultimate number of claims expected (reported and unreported) for each significant coverage. We use historical claim count data to develop age-to-age projections of the ultimate counts by quarterly accident period, from which we deduct reported claims to produce the number of unreported claims. We estimate the average costs per unreported claim and apply such estimates to the unreported claim counts, producing an IBNR liability estimate. We may record additional IBNR estimates when actuarial techniques are difficult to apply.

We test the adequacy of the aggregate claim liabilities using one or more actuarial projections based on claim closure models and paid and incurred loss triangles. Each type of projection analyzes loss occurrence data for claims occurring in a given period and projects the ultimate cost.

Our claim liability estimates recorded at the end of 2020 were reduced by $1.8 billion during 2021, which produced a corresponding increase to pre-tax earnings. The assumptions used to estimate liabilities at December 31, 2021 reflect the most recent frequency and severity estimates. Future development of recorded liabilities will depend on whether actual frequency and severity of claims are more or less than anticipated.

With respect to liabilities for BI claims, we believe it is reasonably possible that average claims severities will change by at least one percentage point from the projected severities used in establishing the recorded liabilities at December 31, 2021. We estimate that a one percentage point increase or decrease in BI severities would produce a $290 million increase or decrease in recorded liabilities, with a corresponding decrease or increase in pre-tax earnings. Many of the economic forces that would likely cause BI severity to differ from expectations would likely also cause severities for other injury coverages to differ in the same direction.

Berkshire Hathaway Reinsurance Group

BHRG's liabilities for unpaid losses and loss adjustment expenses derive primarily from reinsurance contracts issued through NICO and General Re. A summary of BHRG's property and casualty unpaid losses and loss adjustment expenses, other than retroactive reinsurance losses and loss adjustment expenses, as of December 31, 2021 follows (in millions).

	Property	Casualty	Total
Reported case liabilities	$ 6,602	$ 9,630	$ 16,232
IBNR liabilities	6,780	15,227	22,007
Gross unpaid losses and loss adjustment expenses	13,382	24,857	38,239
Reinsurance recoverable	181	892	1,073
Net unpaid losses and loss adjustment expenses	$ 13,201	$ 23,965	$ 37,166

Property and casualty losses *(Continued)*

Berkshire Hathaway Reinsurance Group (Continued)

Gross unpaid losses and loss adjustment expenses consist primarily of traditional property and casualty coverages written primarily under excess-of-loss and quota-share treaties. Under certain contracts, coverage can apply to multiple lines of business written and the ceding company may not report loss data by such lines consistently, if at all. In those instances, we allocate losses to property and casualty coverages based on internal estimates.

In connection with reinsurance contracts, the nature, extent, timing and perceived reliability of loss information received from ceding companies varies widely depending on the type of coverage and the contractual reporting terms. Reinsurance contract terms, conditions and coverages also tend to lack standardization and may evolve more rapidly than primary insurance policies.

The nature and extent of loss information provided under many facultative (individual risk) or per occurrence excess contracts may be comparable to the information received under a primary insurance contract. However, loss information with respect to aggregate excess-of-loss and quota-share contracts is often in a summary format rather than on an individual claim basis. Loss data includes recoverable paid losses, as well as case loss estimates. Ceding companies infrequently provide reliable IBNR loss estimates.

Loss reporting to reinsurers is typically slower in comparison to primary insurers. In the U.S., such reporting is generally required at quarterly intervals ranging from 30 to 90 days after the end of the quarterly period, while outside of the U.S., reinsurance reporting practices may vary further. In certain countries, clients report annually from 90 to 180 days after the end of the annual period. To the extent that reinsurers assume and cede underlying risks from other reinsurers, further delays in claims reporting may occur. The relative impact of reporting delays on the reinsurer may vary depending on the type of coverage, contractual reporting terms, the magnitude of the claim relative to the attachment point of the reinsurance coverage, and for other reasons.

As reinsurers, the premium and loss data we receive is at least one level removed from the underlying claimant, so there is a risk that the loss data reported is incomplete, inaccurate or the claim is outside the coverage terms. We maintain certain internal procedures to determine that the information is complete and in compliance with the contract terms. Generally, our reinsurance contracts permit us to access the ceding company's records with respect to the subject business, thus providing the ability to audit the reported information. In the normal course of business, disputes occasionally arise concerning whether claims are covered by our reinsurance policies. We resolve most coverage disputes through negotiation with the client. If disputes cannot be resolved, our contracts generally provide arbitration or alternative dispute resolution processes. There are no coverage disputes at this time for which an adverse resolution would likely have a material impact on our consolidated results of operations or financial condition.

Establishing claim liability estimates for reinsurance assumed requires evaluation of loss information received from our clients. We generally rely on the ceding companies' reported case loss estimates. We independently evaluate certain reported case losses and if appropriate, we use our own case liability estimate. For instance, as of December 31, 2021, our case loss estimates exceeded ceding company estimates by approximately $700 million for certain legacy workers' compensation claims occurring over 10 years ago. We also periodically conduct detailed reviews of individual client claims, which may cause us to adjust our case estimates.

Although liabilities for losses are initially determined based on pricing and underwriting analysis, we use a variety of actuarial methodologies that place reliance on the extrapolation of actual historical data, loss development patterns, industry data and other benchmarks, as appropriate. The estimate of the IBNR liabilities also requires judgment by actuaries and management to reflect the impact of additional factors like change in business mix, volume, claim reporting and handling practices, inflation, social and legal environment and the terms and conditions of the contracts. The methodologies generally fall into one of the following categories or are hybrids of one or more of the following categories:

Property and casualty losses *(Continued)*

Berkshire Hathaway Reinsurance Group (Continued)

Paid and incurred loss development methods – these methods consider expected case loss emergence and development patterns, together with expected loss ratios by year. Factors affecting our loss development analysis include, but are not limited to, changes in the following: client claims reporting and settlement practices; the frequency of client company claim reviews; policy terms and coverage (such as loss retention levels and occurrence and aggregate policy limits); loss trends; and legal trends that result in unanticipated losses. Collectively, these factors influence our selections of expected case loss emergence patterns.

Incurred and paid loss Bornhuetter-Ferguson methods – these methods consider actual paid and incurred losses and expected patterns of paid and incurred losses, taking the initial expected ultimate losses into account to determine an estimate of the expected unpaid or unreported losses.

Frequency and severity methods – these methods commonly focus on a review of the number of anticipated claims and the anticipated claims severity and may also rely on development patterns to derive such estimates. However, our processes and techniques for estimating liabilities in such analyses generally rely more on a per-policy assessment of the ultimate cost associated with the individual loss rather than with an analysis of historical development patterns of past losses.

Additional analysis – in some cases we have established reinsurance claim liabilities on a contract-by-contract basis, determined from case loss estimates reported by the ceding company and IBNR liabilities that are primarily a function of an anticipated loss ratio for the contract and the reported case loss estimate. Liabilities are adjusted upward or downward over time to reflect case losses reported versus expected case losses, which we use to form revised judgement on the adequacy of the expected loss ratio and the level of IBNR liabilities required for unreported claims. Anticipated loss ratios are also revised to include estimates of known major catastrophe events.

Our claim liability estimation process for short-tail lines, primarily property exposures, utilizes a combination of the paid and incurred loss development methods and the incurred and paid loss Bornhuetter-Ferguson methods. Certain catastrophe, individual risk and aviation excess-of-loss contracts tend to generate low frequency/high severity losses. Our processes and techniques for estimating liabilities under such contracts generally rely more on a per contract assessment of the ultimate cost associated with the individual loss event rather than with an analysis of the historical development patterns of past losses.

For our long-tail lines, primarily casualty exposures, we may rely on different methods depending on the maturity of the business, with estimates for the most recent years being based on priced loss expectations and more mature years reflecting the paid or incurred development pattern indications.

In 2021, certain workers' compensation claims reported losses were less than expected. As a result, we reduced estimated ultimate losses for prior years' loss events by $136 million. We estimate that increases of ten percent in the tail of the expected loss emergence pattern and in the expected loss ratios would produce a net increase of approximately $1.0 billion in IBNR liabilities, producing a corresponding decrease in pre-tax earnings. We believe it is reasonably possible for these assumptions to increase at these rates.

For other casualty losses, excluding asbestos, environmental, and other latent injury claims, we reduced estimated ultimate liabilities for prior years' events by approximately $375 million in 2021. For certain significant casualty and general liability portfolios, we estimate that increases of five percent in the claim-tails of the expected loss emergence patterns and in the expected loss ratios would produce a net increase in our nominal IBNR liabilities and a corresponding reduction in pre-tax earnings of approximately $950 million, although outcomes of greater than or less than $950 million are possible given the diversification in worldwide business.

The change in estimated ultimate liabilities for asbestos, environmental and other latent injury claims, excluding amounts assumed under retroactive reinsurance contracts was not significant in 2021. Net liabilities for such claims were approximately $2.1 billion at December 31, 2021. Loss estimations for these exposures are difficult to determine due to the changing legal environment and increases may be required in the future if new exposures or claimants are identified, new claims are reported or new theories of liability emerge.

Property and casualty losses *(Continued)*

Retroactive reinsurance

Our retroactive reinsurance contracts cover loss events occurring before the contract inception dates. Claim liabilities associated with our retroactive reinsurance contracts predominately pertain to casualty or liability exposures. We expect the claim-tails to be very long. As of December 31, 2021, gross unpaid losses were $38.3 billion and deferred charges were $10.6 billion.

Our contracts are generally subject to maximum limits of indemnifications and, as such, we currently expect that maximum remaining gross losses payable under our retroactive policies will not exceed $54 billion. Absent significant judicial or legislative changes affecting asbestos, environmental or latent injury exposures, we also currently believe it unlikely that losses will develop upward to the maximum losses payable or downward by more than 15% of our estimated gross liability.

We establish liability estimates by individual contract, considering exposure and development trends. In establishing our liability estimates, we often analyze historical aggregate loss payment patterns and project expected ultimate losses under various scenarios. We assign judgmental probability factors to these scenarios and an expected outcome is determined. We then monitor subsequent loss payment activity and review ceding company reports and other available information concerning the underlying losses. We re-estimate the expected ultimate losses when significant events or significant deviations from expected results are revealed.

Certain of our retroactive reinsurance contracts include asbestos, environmental and other latent injury claims. Our estimated liabilities for such claims were approximately $12.3 billion at December 31, 2021. We do not consistently receive reliable detailed data regarding asbestos, environmental and latent injury claims from all ceding companies, particularly with respect to multi-line or aggregate excess-of-loss policies. When possible, we conduct a detailed analysis of the underlying loss data to make an estimate of ultimate reinsured losses. When detailed loss information is unavailable, we develop estimates by applying recent industry trends and projections to aggregate client data. Judgments in these areas necessarily consider the stability of the legal and regulatory environment under which we expect claims will be adjudicated. Legal reform and legislation could also have a significant impact on our ultimate liabilities.

We reduced estimated ultimate liabilities for prior years' retroactive reinsurance contracts by $974 million in 2021, which after the changes in related deferred charges, resulted in pre-tax earnings of $142 million. In 2021, we paid losses and loss adjustment expenses of $1.9 billion with respect to our retroactive reinsurance contracts.

In connection with our retroactive reinsurance contracts, we also record deferred charges, which at contract inception represents the excess, if any, of the estimated ultimate liability for unpaid losses over premiums received. We amortize deferred charges, which produces charges to pre-tax earnings in future periods based on the expected timing and amount of loss payments. We also adjust deferred charge balances due to changes in the expected timing and ultimate amount of claim payments and the effects of the adjustments are included in pre-tax earnings. Significant changes in such estimates may have a significant effect on unamortized deferred charge balances. Based on the contracts in effect as of December 31, 2021, we estimate that amortization expense in 2022 will approximate $950 million.

Other Critical Accounting Policies

Our Consolidated Balance Sheet at December 31, 2021 includes goodwill of acquired businesses of $73.9 billion and other indefinite-lived intangible assets of $18.5 billion. We evaluate these assets for impairment annually in the fourth quarter and on an interim basis if the facts and circumstances lead us to believe that more-likely-not there has been an impairment.

Goodwill and indefinite-lived intangible asset impairment reviews include determining the estimated fair values of our reporting units and indefinite-lived intangible assets. The key assumptions and inputs used in such determinations may include forecasting revenues and expenses, cash flows and capital expenditures, as well as an appropriate discount rate and other inputs. Significant judgment by management is required in estimating the fair value of a reporting unit and in performing impairment reviews. Due to the inherent subjectivity and uncertainty in forecasting future cash flows and earnings over long periods of time, actual results may differ materially from the forecasts. If the carrying value of the indefinite-lived intangible asset exceeds fair value, the excess is charged to earnings as an impairment loss. If the carrying value of a reporting unit exceeds the estimated fair value of the reporting unit, then the excess, limited to the carrying amount of goodwill, will be charged to earnings as an impairment loss.

Other Critical Accounting Policies *(Continued)*

As of December 31, 2021, we concluded it is more likely than not that goodwill recorded in our Consolidated Balance Sheet was not impaired. The fair value estimates of reporting units are and will likely be significantly affected by assumptions on the severity, duration or long-term effects of the pandemic on the reporting unit's business, as well as other assumptions concerning the long-term economic performance of the reporting unit, which we cannot reliably predict. Consequently, any fair value estimates in such instances can be subject to wide variations.

We primarily use discounted projected future earnings or cash flow methods in determining fair values. The key assumptions and inputs used in such methods may include forecasting revenues and expenses, cash flows and capital expenditures, as well as an appropriate discount rate and other inputs. A significant amount of judgment is required in estimating the fair value of a reporting unit and in performing goodwill impairment tests.

In connection with the annual goodwill impairment review conducted in the fourth quarter of 2021, the estimated fair values of five reporting units did not exceed our carrying values by at least 20%. The most significant of these reporting units was Precision Castparts Corp. ("PCC"). The estimated fair value of PCC was approximately $34.5 billion, exceeding our carrying value of approximately $31.1 billion by 10.7%. Our carrying value of PCC included goodwill of approximately $7.5 billion. For the four other reporting units, our aggregate estimated fair value was approximately $2.5 billion, which exceeded our aggregate carrying value of approximately $2.3 billion by 9.2%. Our carrying value of these units included goodwill of approximately $1.2 billion.

In the second quarter of 2020, we quantitively reevaluated goodwill for impairment for certain reporting units, and most significantly for PCC. As a result of our reviews, we recorded pre-tax goodwill impairment charges of $10.0 billion and indefinite-lived intangible asset impairment charges of $638 million, of which approximately $10 billion related to PCC. Prior to the reevaluation, the carrying value of PCC-related goodwill was approximately $17 billion. Additionally, the carrying value of PCC-related indefinite-lived intangible assets was approximately $14 billion. Substantially all of these amounts were recorded in connection with Berkshire's acquisition of PCC in 2016. The initial effects of the COVID-19 pandemic on commercial airlines and aircraft manufacturers were particularly severe. At that time, we considered several factors in our reevaluation, including but not limited to the announcements by airlines concerning potential future demand, employment levels and aircraft orders, announcements by manufacturers of reduced aircraft production, and the actions we were taking or may be taking in the future to restructure operations. Consequently, we deemed it prudent under the prevailing circumstances to increase discount rates and reduce prior long-term forecasts of future cash flows for purposes of reviewing for impairments.

Market Risk Disclosures

Our Consolidated Balance Sheets include substantial amounts of assets and liabilities whose fair values are subject to market risks. Our significant market risks are primarily associated with equity prices, interest rates, foreign currency exchange rates and commodity prices. The fair values of our investment portfolios remain subject to considerable volatility. The following sections address the significant market risks associated with our business activities.

Equity Price Risk

Equity securities represent a significant portion of our consolidated investment portfolio. Strategically, we strive to invest in businesses that possess excellent economics and able and honest management, and we prefer to invest a meaningful amount in each company. Historically, equity investments have been concentrated in relatively few issuers. At December 31, 2021, approximately 73% of the total fair value of equity securities was concentrated in four companies.

We often hold our equity securities for long periods and short-term price volatility has occurred in the past and will occur in the future. We also strive to maintain significant levels of shareholder capital and ample liquidity to provide a margin of safety against short-term price volatility.

Equity Price Risk *(Continued)*

We are also subject to equity price risk with respect to our equity index put option contracts, although our equity price exposure has declined significantly as a vast majority of the contracts written to date have expired. Our ultimate liability with respect to these contracts is determined from the movement of the underlying stock index between the contract inception date and expiration date. The fair values of our liabilities arising from these contracts are also affected by changes in other factors.

The following table summarizes our equity securities and equity index put option contract liabilities as of December 31, 2021 and 2020 and the estimated effects of a hypothetical 30% increase and a 30% decrease in market prices as of those dates. The selected 30% hypothetical increase and decrease does not reflect the best or worst case scenario. Indeed, results from declines could be far worse due both to the nature of equity markets and the aforementioned concentrations existing in our equity investment portfolio. Dollar amounts are in millions.

	Fair Value	Hypothetical Price Change	Estimated Fair Value after Hypothetical Change in Prices	Estimated Increase (Decrease) in Net Earnings *(1)*
December 31, 2021				
Investments in equity securities	$ 350,719	30% increase	$ 452,936	$ 81,136
		30% decrease	248,606	(81,053)
Equity index put option contract liabilities	99	30% increase	5	74
		30% decrease	1,088	(781)
December 31, 2020				
Investments in equity securities	$ 281,170	30% increase	$ 362,830	$ 63,321
		30% decrease	199,547	(63,293)
Equity index put option contract liabilities	1,065	30% increase	257	638
		30% decrease	2,702	(1,293)

(1) *The estimated increase (decrease) is after income taxes at the statutory rate in effect as of the balance sheet date.*

Interest Rate Risk

We may also invest in bonds, loans or other interest rate sensitive instruments. Our strategy is to acquire or originate such instruments at prices considered appropriate relative to the perceived credit risk. We also issue debt in the ordinary course of business to fund business operations, business acquisitions and for other general purposes. We attempt to maintain high credit ratings, in order to minimize the cost of our debt. We infrequently utilize derivative products, such as interest rate swaps, to manage interest rate risks and we do not attempt to match maturities of assets and liabilities.

The fair values of our fixed maturity investments, loans and finance receivables, and notes payable and other borrowings will fluctuate in response to changes in market interest rates. Interest rate risks associated with the valuations of our equity index put option contract liabilities are no longer considered significant due to the short duration of remaining exposures as of December 31, 2021. Increases and decreases in interest rates generally translate into decreases and increases in fair values of these instruments. Additionally, fair values of interest rate sensitive instruments may be affected by the creditworthiness of the issuer, prepayment options, relative values of alternative investments, the liquidity of the instrument and other general market conditions.

Interest Rate Risk *(Continued)*

The following table summarizes the estimated effects of hypothetical changes in interest rates on our significant assets and liabilities that are subject to significant interest rate risk at December 31, 2021 and 2020. We assumed that the interest rate changes occur immediately and uniformly to each category of instrument and that there were no significant changes to other factors used to determine the value of the instrument. The hypothetical changes in interest rates do not reflect the best or worst case scenarios. Actual results may differ from those reflected in the table. Dollars are in millions.

		Estimated Fair Value after Hypothetical Change in Interest Rates (bp=basis points)			
	Fair Value	100 bp decrease	100 bp increase	200 bp increase	300 bp increase
December 31, 2021					
Assets:					
Investments in fixed maturity securities	$ 16,434	$ 16,624	$ 16,231	$ 16,036	$ 15,847
Investments in equity securities*	10,864	11,457	10,313	9,798	9,319
Loans and finance receivables	22,174	22,982	21,417	20,714	20,054
Liabilities:					
Notes payable and other borrowings:					
Insurance and other	42,339	46,559	38,724	35,683	33,104
Railroad, utilities and energy	87,065	97,474	78,472	71,289	65,246
Equity index put option contracts	99	105	94	89	84
December 31, 2020					
Assets:					
Investments in fixed maturity securities	$ 20,410	$ 20,622	$ 20,139	$ 19,879	$ 19,628
Investments in equity securities*	8,891	9,408	8,413	7,970	7,559
Loans and finance receivables	20,554	21,472	19,916	19,219	18,570
Liabilities:					
Notes payable and other borrowings:					
Insurance and other	46,676	50,754	42,785	39,514	36,739
Railroad, utilities and energy	92,593	102,926	83,070	75,484	69,093
Equity index put option contracts	1,065	1,125	1,008	953	900

* *Includes Cumulative Perpetual Preferred Stocks*

Foreign Currency Risk

Certain of our subsidiaries operate in foreign jurisdictions and we transact business in foreign currencies. In addition, we hold investments in common stocks of major multinational companies, who have significant foreign business and foreign currency risk of their own. We generally do not attempt to match assets and liabilities by currency and do not use derivative contracts to manage foreign currency risks in a meaningful way.

Foreign Currency Risk *(Continued)*

Our net assets subject to financial statement translation into U.S. Dollars are primarily in our insurance, utilities and energy and certain manufacturing and service subsidiaries. A portion of our financial statement translation-related impact from changes in foreign currency rates is recorded in other comprehensive income. In addition, we include gains or losses from changes in foreign currency exchange rates in net earnings related to non-U.S. Dollar denominated assets and liabilities of Berkshire and U.S.-based subsidiaries. A summary of these gains (losses), after-tax, for each of the years ending December 31, 2021 and 2020 follows (in millions).

	2021	2020
Non-U.S. denominated debt included in net earnings	$ 955	$ (764)
Net liabilities under certain reinsurance contracts included in net earnings	58	(163)
Foreign currency translation included in other comprehensive income	(1,021)	1,264

Commodity Price Risk

Our subsidiaries use commodities in various ways in manufacturing and providing services. As such, we are subject to price risks related to various commodities. In most instances, we attempt to manage these risks through the pricing of our products and services to customers. To the extent that we are unable to sustain price increases in response to commodity price increases, our operating results will likely be adversely affected. We do not utilize derivative contracts to manage commodity price risks to any significant degree.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

See "Market Risk Disclosures" contained in Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Management's Report on Internal Control Over Financial Reporting

Management of Berkshire Hathaway Inc. is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in the Securities Exchange Act of 1934 Rule 13a-15(f). Under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of the Company's internal control over financial reporting as of December 31, 2021, as required by the Securities Exchange Act of 1934 Rule 13a-15(c). In making this assessment, we used the criteria set forth in the framework in *Internal Control—Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on our evaluation under the framework in *Internal Control—Integrated Framework* (2013), our management concluded that our internal control over financial reporting was effective as of December 31, 2021.

The effectiveness of our internal control over financial reporting as of December 31, 2021 has been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report which appears on page K-67.

Berkshire Hathaway Inc.
February 26, 2022

Item 8. Financial Statements and Supplementary Data

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of
Berkshire Hathaway Inc.
Omaha, Nebraska

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Berkshire Hathaway Inc. and subsidiaries (the "Company") as of December 31, 2021 and 2020, the related consolidated statements of earnings, comprehensive income, changes in shareholders' equity, and cash flows, for each of the three years in the period ended December 31, 2021, and the related notes (collectively referred to as the "financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021, in conformity with accounting principles generally accepted in the United States of America. Also, in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by COSO.

Basis for Opinions

The Company's management is responsible for these financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on these financial statements and an opinion on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the US federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the financial statements included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures to respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current-period audit of the financial statements that were communicated or required to be communicated to the audit committee and that (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Unpaid Losses and Loss Adjustment Expenses— Refer to Notes 1 and 16 to the financial statements

Critical Audit Matter Description

The Company's unpaid losses and loss adjustment expenses ("claim liabilities") under short duration property and casualty insurance and reinsurance contracts are $86,664 million as of December 31, 2021. The key assumptions affecting certain claim liabilities include expected loss and expense ("loss") ratios, expected claim count emergence patterns, expected loss payment emergence patterns and expected loss reporting emergence patterns.

Given the subjectivity of estimating these key assumptions, performing audit procedures to evaluate whether claim liabilities were appropriately recorded as of December 31, 2021, required a high degree of auditor judgment and an increased extent of effort, including the need to involve our actuarial specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the key assumptions affecting certain claim liabilities included the following, among others:

- We tested the operating effectiveness of controls over claim liabilities, including those over the key assumptions.
- We evaluated the methods and assumptions used by management to estimate the claim liabilities by:
  - Testing the underlying data that served as the basis for the actuarial analysis, such as historical claims and earned premium, to test that the inputs to the actuarial estimate were reasonable.
  - Comparing management's prior-year claim liabilities to actual development during the current year to identify potential bias in the determination of the claim liabilities.
- With the assistance of our actuarial specialists:
  - We developed independent estimates of the claim liabilities, including loss data and industry claim development factors as needed, and compared our estimates to management's estimates.
  - We compared management's change in ultimate loss and loss adjustment expense to prior year estimates to test the reasonableness of the prior year estimates and assessed unexpected development.

Unpaid Losses and Loss Adjustment Expenses Under Retroactive Reinsurance Contracts — Refer to Notes 1 and 17 to the financial statements

Critical Audit Matter Description

The Company's unpaid losses and loss adjustment expenses ("claim liabilities") for property and casualty retroactive reinsurance contracts are $38,256 million as of December 31, 2021. The key assumptions affecting certain claim liabilities and related deferred charge reinsurance assumed assets ("related assets") include expected loss and expense ("loss") ratios, expected loss payment emergence patterns and expected loss reporting emergence.

Given the subjectivity of estimating these key assumptions, performing audit procedures to evaluate whether claim liabilities were appropriately recorded as of December 31, 2021, required a high degree of auditor judgment and an increased extent of effort, including the need to involve our actuarial specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the key assumptions affecting claim liabilities and related assets included the following, among others:

- We tested the operating effectiveness of controls over claim liabilities and related assets, including those over the key assumptions.

- We evaluated the methods and assumptions used by management to estimate the claim liabilities and related assets by:
  - Testing the underlying data that served as the basis for the actuarial analysis, including historical claims, to test that the inputs to the actuarial estimate were reasonable.
  - Comparing management's prior-year claim liabilities to actual development during the current year to identify potential bias in the determination of the claim liabilities and related assets.
- With the assistance of our actuarial specialists:
  - We developed independent claim liability estimates for certain retroactive reinsurance contracts and compared our estimates to management's estimates. For other retroactive reinsurance contracts and related assets, we evaluated the process used by management to develop the estimated claim liabilities and related assets.
  - We compared management's change in ultimate loss and loss adjustment expense to prior year estimates, assessed unexpected development and assessed internal rates of return.

Goodwill and Indefinite-Lived Intangible Assets — Refer to Notes 1 and 13 to the financial statements

Critical Audit Matter Description

The Company's evaluation of goodwill and indefinite-lived intangible assets for impairment involves the comparison of the fair value of each reporting unit or asset to its carrying value. The Company evaluates goodwill and indefinite-lived intangible assets for impairment at least annually. When evaluating goodwill and indefinite-lived intangible assets for impairment, the fair value of each reporting unit or asset is estimated. Significant judgment is required in estimating fair values and performing impairment tests. The Company primarily uses discounted projected future net earnings or net cash flows and multiples of earnings to estimate fair value, which requires management to make significant estimates and assumptions related to forecasts of future revenue, earnings before interest and taxes ("EBIT"), and discount rates. Changes in these assumptions could have a significant impact on the fair value of reporting units and indefinite-lived intangible assets.

The Precision Castparts Corp. ("PCC") reporting unit reported approximately $21 billion of goodwill and indefinite-lived intangible assets as of December 31, 2021. Given the significant judgments made by management to estimate the fair value of the PCC reporting unit and certain customer relationships with indefinite lives along with the difference between their fair values and carrying values, performing audit procedures to evaluate the reasonableness of management's estimates and assumptions related to forecasts of future revenue and EBIT and the selection of the discount rate required a high degree of auditor judgment and an increased extent of effort, including the need to involve our fair value specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to forecasts of future revenue and EBIT and the selection of the discount rate for the PCC reporting unit and certain customer relationships included the following, among others:

- We tested the effectiveness of controls over goodwill and indefinite-lived intangible assets, including those over the forecasts of future revenue and EBIT and the selection of the discount rate.
- We evaluated management's ability to accurately forecast future revenue and EBIT by comparing prior year forecasts to actual results in the respective years.
- We evaluated the reasonableness of management's current revenue and EBIT forecasts by comparing the forecasts to historical results and forecasted information included in analyst and industry reports and certain peer companies' disclosures.
- With the assistance of our fair value specialists, we evaluated the valuation methodologies, the long-term growth rates and discount rate, including testing the underlying source information and the mathematical accuracy of the calculations, and developed a range of independent estimates and compared those to the long-term growth rates and discount rate selected by management.

/s/ Deloitte & Touche LLP
Omaha, Nebraska
February 26, 2022

We have served as the Company's auditor since 1985.

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED BALANCE SHEETS
(dollars in millions)

	December 31,	
	2021	**2020**
ASSETS		
Insurance and Other:		
Cash and cash equivalents*	$ 85,319	$ 44,714
Short-term investments in U.S. Treasury Bills	58,535	90,300
Investments in fixed maturity securities	16,434	20,410
Investments in equity securities	350,719	281,170
Equity method investments	17,375	17,303
Loans and finance receivables	20,751	19,201
Other receivables	35,388	32,310
Inventories	20,954	19,208
Property, plant and equipment	20,834	21,200
Equipment held for lease	14,918	14,601
Goodwill	47,117	47,121
Other intangible assets	28,486	29,462
Deferred charges - retroactive reinsurance	10,639	12,441
Other	15,854	14,580
	743,323	664,021
Railroad, Utilities and Energy:		
Cash and cash equivalents*	2,865	3,276
Receivables	4,177	3,542
Property, plant and equipment	155,530	151,216
Goodwill	26,758	26,613
Regulatory assets	3,963	3,440
Other	22,168	21,621
	215,461	209,708
	$ 958,784	$ 873,729

* *Includes U.S. Treasury Bills with maturities of three months or less when purchased of $61.7 billion at December 31, 2021 and $23.2 billion at December 31, 2020.*

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED BALANCE SHEETS
(dollars in millions)

	December 31, 2021	December 31, 2020
LIABILITIES AND SHAREHOLDERS' EQUITY		
Insurance and Other:		
Unpaid losses and loss adjustment expenses	$ 86,664	$ 79,854
Unpaid losses and loss adjustment expenses under retroactive reinsurance contracts	38,256	40,966
Unearned premiums	23,512	21,395
Life, annuity and health insurance benefits	22,452	21,616
Other policyholder liabilities	9,330	8,670
Accounts payable, accruals and other liabilities	30,376	30,344
Aircraft repurchase liabilities and unearned lease revenues	5,849	5,856
Notes payable and other borrowings	39,272	41,522
	255,711	250,223
Railroad, Utilities and Energy:		
Accounts payable, accruals and other liabilities	15,696	15,224
Regulatory liabilities	7,214	7,475
Notes payable and other borrowings	74,990	75,373
	97,900	98,072
Income taxes, principally deferred	90,243	74,098
Total liabilities	443,854	422,393
Shareholders' equity:		
Common stock	8	8
Capital in excess of par value	35,592	35,626
Accumulated other comprehensive income	(4,027)	(4,243)
Retained earnings	534,421	444,626
Treasury stock, at cost	(59,795)	(32,853)
Berkshire Hathaway shareholders' equity	506,199	443,164
Noncontrolling interests	8,731	8,172
Total shareholders' equity	514,930	451,336
	$ 958,784	$ 873,729

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF EARNINGS
(dollars in millions except per share amounts)

	Year Ended December 31, 2021	2020	2019
Revenues:			
Insurance and Other:			
Insurance premiums earned	$ 69,478	$ 63,401	$ 61,078
Sales and service revenues	145,043	127,044	134,989
Leasing revenues	5,988	5,209	5,856
Interest, dividend and other investment income	7,465	8,092	9,240
	227,974	203,746	211,163
Railroad, Utilities and Energy:			
Freight rail transportation revenues	23,177	20,750	23,357
Energy operating revenues	18,891	15,540	15,353
Service revenues and other income	6,052	5,474	4,743
	48,120	41,764	43,453
Total revenues	276,094	245,510	254,616
Investment and derivative contract gains	78,542	40,746	72,607
Costs and expenses:			
Insurance and Other:			
Insurance losses and loss adjustment expenses	49,964	43,951	44,456
Life, annuity and health insurance benefits	6,007	5,812	4,986
Insurance underwriting expenses	12,569	12,798	11,200
Cost of sales and services	114,138	101,091	107,041
Cost of leasing	4,201	3,520	4,003
Selling, general and administrative expenses	18,843	19,809	19,226
Goodwill and intangible asset impairments	—	10,671	96
Interest expense	1,086	1,105	1,056
	206,808	198,757	192,064
Railroad, Utilities and Energy:			
Freight rail transportation expenses	14,477	13,120	15,436
Utilities and energy cost of sales and other expenses	13,959	11,638	11,296
Other expenses	5,615	4,796	4,002
Interest expense	3,086	2,978	2,905
	37,137	32,532	33,639
Total costs and expenses	243,945	231,289	225,703
Earnings before income taxes and equity method earnings	110,691	54,967	101,520
Equity method earnings	995	726	1,176
Earnings before income taxes	111,686	55,693	102,696
Income tax expense	20,879	12,440	20,904
Net earnings	90,807	43,253	81,792
Earnings attributable to noncontrolling interests	1,012	732	375
Net earnings attributable to Berkshire Hathaway shareholders	$ 89,795	$ 42,521	$ 81,417
Net earnings per average equivalent Class A share	$ 59,460	$ 26,668	$ 49,828
Net earnings per average equivalent Class B share*	$ 39.64	$ 17.78	$ 33.22
Average equivalent Class A shares outstanding	1,510,180	1,594,469	1,633,946
Average equivalent Class B shares outstanding	2,265,269,867	2,391,703,454	2,450,919,020

* *Class B shares are economically equivalent to one-fifteen-hundredth of a Class A share. Accordingly, net earnings per average equivalent Class B share outstanding is equal to one-fifteen-hundredth of the equivalent Class A amount. See Note 21.*

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(dollars in millions)

	Year Ended December 31,		
	2021	**2020**	**2019**
Net earnings	$ 90,807	$ 43,253	$ 81,792
Other comprehensive income:			
Unrealized appreciation of fixed maturity securities	(217)	74	142
Applicable income taxes	50	(19)	(31)
Foreign currency translation	(1,011)	1,284	323
Applicable income taxes	(6)	3	(28)
Defined benefit pension plans	1,775	(355)	(711)
Applicable income taxes	(457)	74	155
Other, net	100	(42)	(48)
Other comprehensive income, net	234	1,019	(198)
Comprehensive income	91,041	44,272	81,594
Comprehensive income attributable to noncontrolling interests	1,030	751	405
Comprehensive income attributable to Berkshire Hathaway shareholders	$ 90,011	$ 43,521	$ 81,189

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY
(dollars in millions)

	Berkshire Hathaway shareholders' equity					
	Common stock and capital in excess of par value	**Accumulated other comprehensive income**	**Retained earnings**	**Treasury stock**	**Non-controlling interests**	**Total**
Balance December 31, 2018	$ 35,715	$ (5,015)	$ 321,112	$ (3,109)	$ 3,797	$ 352,500
Net earnings	—	—	81,417	—	375	81,792
Other comprehensive income, net	—	(228)	—	—	30	(198)
Issuance (acquisition) of common stock	21	—	—	(5,016)	—	(4,995)
Transactions with noncontrolling interests	(70)	—	(36)	—	(430)	(536)
Balance December 31, 2019	35,666	(5,243)	402,493	(8,125)	3,772	428,563
Net earnings	—	—	42,521	—	732	43,253
Adoption of new accounting pronouncement	—	—	(388)	—	—	(388)
Other comprehensive income, net	—	1,000	—	—	19	1,019
Acquisition of common stock	—	—	—	(24,728)	—	(24,728)
Transactions with noncontrolling interests	(32)	—	—	—	3,649	3,617
Balance December 31, 2020	35,634	(4,243)	444,626	(32,853)	8,172	451,336
Net earnings	—	—	89,795	—	1,012	90,807
Other comprehensive income, net	—	216	—	—	18	234
Acquisition of common stock	—	—	—	(26,942)	—	(26,942)
Transactions with noncontrolling interests	(34)	—	—	—	(471)	(505)
Balance December 31, 2021	$ 35,600	$ (4,027)	$ 534,421	$ (59,795)	$ 8,731	$ 514,930

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF CASH FLOWS
(dollars in millions)

	Year Ended December 31,		
	2021	**2020**	**2019**
Cash flows from operating activities:			
Net earnings	$ 90,807	$ 43,253	$ 81,792
Adjustments to reconcile net earnings to operating cash flows:			
Investment (gains) losses	(77,576)	(40,905)	(71,123)
Depreciation and amortization	10,718	10,596	10,064
Other, including asset impairment charges	(3,397)	11,263	(1,254)
Changes in operating assets and liabilities:			
Unpaid losses and loss adjustment expenses	4,595	4,819	6,087
Deferred charges - retroactive reinsurance	1,802	1,307	357
Unearned premiums	2,306	1,587	1,707
Receivables and originated loans	(5,834)	(1,609)	(2,303)
Other assets	(1,686)	(1,109)	(2,011)
Other liabilities	2,389	3,376	190
Income taxes	15,297	7,195	15,181
Net cash flows from operating activities	39,421	39,773	38,687
Cash flows from investing activities:			
Purchases of equity securities	(8,448)	(30,161)	(18,642)
Sales of equity securities	15,849	38,756	14,336
Purchases of U.S. Treasury Bills and fixed maturity securities	(152,637)	(208,429)	(136,123)
Sales of U.S. Treasury Bills and fixed maturity securities	27,188	31,873	15,929
Redemptions and maturities of U.S. Treasury Bills and fixed maturity securities	160,402	149,709	137,767
Purchases of loans and finance receivables	(88)	(772)	(75)
Collections of loans and finance receivables	561	393	345
Acquisitions of businesses, net of cash acquired	(456)	(2,532)	(1,683)
Purchases of property, plant and equipment and equipment held for lease	(13,276)	(13,012)	(15,979)
Other	297	(3,582)	(1,496)
Net cash flows from investing activities	29,392	(37,757)	(5,621)
Cash flows from financing activities:			
Proceeds from borrowings of insurance and other businesses	2,961	5,925	8,144
Repayments of borrowings of insurance and other businesses	(3,032)	(2,700)	(5,095)
Proceeds from borrowings of railroad, utilities and energy businesses	3,959	8,445	5,400
Repayments of borrowings of railroad, utilities and energy businesses	(4,016)	(3,761)	(2,638)
Changes in short term borrowings, net	(624)	(1,118)	266
Acquisition of treasury stock	(27,061)	(24,706)	(4,850)
Other	(695)	(429)	(497)
Net cash flows from financing activities	(28,508)	(18,344)	730
Effects of foreign currency exchange rate changes	5	92	25
Increase (decrease) in cash and cash equivalents and restricted cash	40,310	(16,236)	33,821
Cash and cash equivalents and restricted cash at beginning of year	48,396	64,632	30,811
Cash and cash equivalents and restricted cash at end of year *	$ 88,706	$ 48,396	$ 64,632
** Cash and cash equivalents and restricted cash at end of year are comprised of:*			
Insurance and Other	*$ 85,319*	*$ 44,714*	*$ 61,151*
Railroad, Utilities and Energy	*2,865*	*3,276*	*3,024*
Restricted cash included in other assets	*522*	*406*	*457*
	$ 88,706	*$ 48,396*	*$ 64,632*

See accompanying Notes to Consolidated Financial Statements

(1) Significant accounting policies and practices

(a) Nature of operations and basis of consolidation

Berkshire Hathaway Inc. ("Berkshire") is a holding company owning subsidiaries engaged in a number of diverse business activities, including insurance and reinsurance, freight rail transportation, utilities and energy, manufacturing, service and retailing. In these notes the terms "us," "we," or "our" refer to Berkshire and its consolidated subsidiaries. Further information regarding our reportable business segments is contained in Note 25. Information concerning business acquisitions completed over the past three years appears in Note 2. We believe that reporting the Railroad, Utilities and Energy subsidiaries separately is appropriate given the relative significance of their long-lived assets, capital expenditures and debt, which is not guaranteed by Berkshire.

The accompanying Consolidated Financial Statements include the accounts of Berkshire consolidated with the accounts of all subsidiaries and affiliates in which we hold a controlling financial interest as of the financial statement date. Normally a controlling financial interest reflects ownership of a majority of the voting interests. We consolidate variable interest entities ("VIE") when we possess both the power to direct the activities of the VIE that most significantly affect its economic performance, and we (a) are obligated to absorb the losses that could be significant to the VIE or (b) hold the right to receive benefits from the VIE that could be significant to the VIE. Intercompany accounts and transactions have been eliminated.

(b) Use of estimates in preparation of financial statements

We prepare our Consolidated Financial Statements in conformity with accounting principles generally accepted in the United States ("GAAP") which requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities at the balance sheet date and the reported amounts of revenues and expenses during the period. Our estimates of unpaid losses and loss adjustment expenses are subject to considerable estimation error due to the inherent uncertainty in projecting ultimate claim costs. In addition, estimates and assumptions associated with the amortization of deferred charges on retroactive reinsurance contracts, determinations of fair values of certain financial instruments and evaluations of goodwill and indefinite-lived intangible assets for impairment require considerable judgment. Actual results may differ from the estimates used in preparing our Consolidated Financial Statements.

The novel coronavirus ("COVID-19") spread rapidly across the world in 2020 and was declared a pandemic by the World Health Organization. The government and private sector responses to contain its spread began to significantly affect our operating businesses in March of 2020. The COVID-19 pandemic adversely affected nearly all of our operations during 2020, although the effects varied significantly. The extent of the effects over longer terms on the demand for certain of our products and services cannot be reasonably estimated at this time. Accordingly, significant estimates used in the preparation of our financial statements including those associated with evaluations of certain long-lived assets, goodwill and other intangible assets for impairment, expected credit losses on amounts owed to us and the estimations of certain losses assumed under insurance and reinsurance contracts may be subject to significant adjustments in future periods.

(c) Cash and cash equivalents and short-term investments in U.S. Treasury Bills

Cash equivalents consist of demand deposit and money market accounts and investments with maturities of three months or less when purchased. Short-term investments in U.S. Treasury Bills consist of U.S. Treasury Bills with maturities exceeding three months at the time of purchase and are stated at amortized cost, which approximates fair value.

(d) Investments in fixed maturity securities

We classify investments in fixed maturity securities on the acquisition date and at each balance sheet date. Securities classified as held-to-maturity are carried at amortized cost, reflecting the ability and intent to hold the securities to maturity. Securities classified as trading are acquired with the intent to sell in the near term and are carried at fair value with changes in fair value reported in earnings. All other securities are classified as available-for-sale and are carried at fair value. Substantially all of investments in fixed maturity securities are classified as available-for-sale. We amortize the difference between the original cost and maturity value of a fixed maturity security to earnings using the interest method.

(1) Significant accounting policies and practices *(Continued)*

(d) Investments in fixed maturity securities (Continued)

We record investment gains and losses on available-for-sale fixed maturity securities when the securities are sold, determined on a specific identification basis. For securities in an unrealized loss position, we recognize a loss in earnings for the excess of amortized cost over fair value if we intend to sell before the price recovers. As of the balance sheet date, we evaluate whether the other unrealized losses are attributable to credit losses or other factors. We consider the severity of the decline in value, creditworthiness of the issuer and other relevant factors. We record an allowance for credit losses, limited to the excess of amortized cost over fair value, with a corresponding charge to earnings if the present value of estimated cash flows is less than the present value of contractual cash flows. The allowance may be subsequently increased or decreased based on the prevailing facts and circumstances. The portion of the unrealized loss that we believe is not related to a credit loss is recognized in other comprehensive income.

(e) Investments in equity securities

We carry substantially all investments in equity securities at fair value and record the subsequent changes in fair values in the Consolidated Statements of Earnings as a component of investment gains or losses.

(f) Investments under the equity method

We utilize the equity method to account for investments when we possess the ability to exercise significant influence, but not control, over the operating and financial policies of the investee. The ability to exercise significant influence is presumed when the investor possesses more than 20% of the voting interests of the investee. This presumption may be overcome based on specific facts and circumstances that demonstrate that the ability to exercise significant influence is restricted. We apply the equity method to investments in common stock and other investments when such investments possess substantially identical subordinated interests to common stock.

In applying the equity method, we record the investment at cost and subsequently increase or decrease the carrying amount of the investment by our proportionate share of the net earnings or losses and other comprehensive income of the investee. We record dividends or other equity distributions as reductions in the carrying value of the investment. If net losses reduce our carrying amount to zero, additional net losses may be recorded if other investments in the investee are at-risk, even if we have not committed to provide financial support to the investee. Such additional equity method losses, if any, are based upon the change in our claim on the investee's book value.

(g) Loans and finance receivables

Loans and finance receivables are primarily manufactured home loans, and to a lesser extent, commercial loans and site-built home loans. We carry substantially all loans and finance receivables at amortized cost, net of allowances for expected credit losses, based on our ability and intent to hold such loans to maturity. Acquisition costs and loan origination and commitment costs paid and fees received, as well as acquisition premiums or discounts, are amortized as yield adjustments over the lives of the loans.

Prior to 2020, credit losses were measured when non-collection was considered probable based on the prevailing facts and circumstances. Beginning in 2020, measurements of expected credit losses include provisions for non-collection, whether the risk is probable or remote. Expected credit losses on manufactured home loans are based on the net present value of future principal payments less estimated expenses related to the charge-off and foreclosure of expected uncollectible loans and include provisions for loans that are not in foreclosure. Our principal credit quality indicator is whether the loans are performing. Expected credit loss estimates consider historical default rates, collateral recovery rates, historical runoff rates, interest rates, reductions of future cash flows for modified loans and the historical time elapsed from last payment until foreclosure, among other factors. In addition, our estimates consider current conditions and reasonable and supportable forecasts.

Loans are considered delinquent when payments are more than 30 days past due. We place loans over 90 days past due on nonaccrual status and accrued but uncollected interest is reversed. Subsequent collections on the loans are first applied to the principal and interest owed for the most delinquent amount. We resume interest income accrual once a loan is less than 90 days delinquent.

Loans are considered non-performing when the foreclosure process has started. Once a loan is in the process of foreclosure, interest income is not recognized until the foreclosure is cured or the loan is modified.

Once a modification is complete, interest income is recognized based on the terms of the new loan. Foreclosed loans are charged off when the collateral is sold. Loans not in foreclosure are evaluated for charge-off based on individual circumstances concerning the future collectability of the loan and the condition of the collateral securing the loan.

(1) Significant accounting policies and practices *(Continued)*

(h) Other receivables

Other receivables include balances due from customers, insurance premiums receivable and reinsurance losses recoverable, as well as other receivables. Trade receivables, insurance premium receivables and other receivables are primarily short-term in nature with stated collection terms of less than one year from the date of origination. Reinsurance recoverables are comprised of amounts ceded under reinsurance contracts or pursuant to mandatory government-sponsored insurance programs. Reinsurance recoverables relate to unpaid losses and loss adjustment expenses arising from property and casualty contracts and benefits under life and health contracts. Receivables are stated net of estimated allowances for uncollectible balances. Prior to 2020, we recorded provisions for uncollectible balances when it was probable counterparties or customers would be unable to pay all amounts due based on the contractual terms and historical loss history.

Beginning in 2020, we adopted a new accounting pronouncement that affects the measurement of allowances for credit losses. In measuring credit loss allowances, we primarily utilize credit loss history, with adjustments to reflect current or expected future economic conditions when reasonable and supportable forecasts of losses deviate from historical experience. In evaluating expected credit losses of reinsurance recoverables on unpaid losses, we review the credit quality of the counterparty and consider right-of-offset provisions within reinsurance contracts and other forms of credit enhancement including collateral, guarantees and other available information. We charge-off receivables against the allowances after all reasonable collection efforts are exhausted.

(i) Derivatives

We carry derivative contracts in accounts payable, accruals and other liabilities in our Consolidated Balance Sheets at fair value, net of reductions permitted under master netting agreements with counterparties. We record the changes in fair value of derivative contracts that do not qualify as hedging instruments for financial reporting purposes in earnings or, if such contracts involve our regulated utilities subsidiaries, as regulatory assets or liabilities when inclusion in regulated rates is probable.

(j) Fair value measurements

As defined under GAAP, fair value is the price that would be received to sell an asset or paid to transfer a liability between market participants in the principal market or in the most advantageous market when no principal market exists. Adjustments to transaction prices or quoted market prices may be required in illiquid or disorderly markets in estimating fair value. Alternative valuation techniques may be appropriate under the circumstances to determine the value that would be received to sell an asset or paid to transfer a liability in an orderly transaction. Market participants are assumed to be independent, knowledgeable, and able and willing to transact an exchange and not acting under duress. Our nonperformance or credit risk is considered in determining the fair value of liabilities. Considerable judgment may be required in interpreting market data used to develop the estimates of fair value. Accordingly, estimates of fair value presented herein are not necessarily indicative of the amounts that could be realized in a current or future market exchange.

(k) Inventories

Inventories consist of manufactured goods, goods or products acquired for resale and homes constructed for sale. Manufactured inventory costs include materials, direct and indirect labor and factory overhead. At December 31, 2021, we used the last-in-first-out ("LIFO") method to value approximately 31% of consolidated inventories with the remainder primarily determined under first-in-first-out and average cost methods. Non-LIFO inventories are stated at the lower of cost or net realizable value. The excess of current or replacement costs over costs determined under LIFO was approximately \$1.9 billion as of December 31, 2021 and \$1.1 billion as of December 31, 2020.

(l) Property, plant and equipment

We record additions to property, plant and equipment used in operations at cost, which includes asset additions, improvements and betterments. With respect to constructed assets, all materials, direct labor and contract services as well as certain indirect costs are capitalized. Indirect costs include interest over the construction period. With respect to constructed assets of our utility and energy subsidiaries that are subject to authoritative guidance for regulated operations, capitalized costs also include an allowance for funds used during construction, which represents the cost of equity funds used to finance the construction of the regulated facilities. Normal repairs and maintenance and other costs that do not improve the property, extend its useful life or otherwise do not meet capitalization criteria are charged to expense as incurred.

(1) Significant accounting policies and practices *(Continued)*

(l) Property, plant and equipment (Continued)

Depreciation of assets of our regulated utilities and railroad is generally determined using group depreciation methods where rates are based on periodic depreciation studies approved by the applicable regulator. Under group depreciation, a composite rate is applied to the gross investment in a particular class of property, despite differences in the service life or salvage value of individual property units within the same class. When such assets are retired or sold, no gain or loss is recognized. Gains or losses on disposals of all other assets are recorded through earnings.

We depreciate property, plant and equipment used by our other businesses to the estimated salvage value primarily using the straight-line method over estimated useful lives. Ranges of estimated useful lives of depreciable assets used in our other businesses are as follows: buildings and improvements – 5 to 50 years, machinery and equipment – 3 to 25 years and furniture, fixtures and other – 3 to 15 years. Ranges of estimated useful lives of depreciable assets unique to our railroad business are as follows: track structure and other roadway – 10 to 100 years and locomotives, freight cars and other equipment – 6 to 43 years. Ranges of estimated useful lives of assets unique to our regulated utilities and energy businesses are as follows: utility generation, transmission and distribution systems – 5 to 80 years, interstate natural gas pipeline assets – 3 to 80 years and independent power plants and other assets – 2 to 50 years.

We evaluate property, plant and equipment for impairment when events or changes in circumstances indicate that the carrying value of such assets may not be recoverable or when the assets are held for sale. Upon the occurrence of a triggering event, we assess whether the estimated undiscounted cash flows expected from the use of the asset and the residual value from the ultimate disposal of the asset exceeds the carrying value. If the carrying value exceeds the estimated recoverable amounts, we reduce the carrying value to fair value and record an impairment loss in earnings, except with respect to impairment of assets of our regulated utility and energy subsidiaries where the impacts of regulation are considered in evaluating the carrying value.

(m) Leases

We are party to contracts where we lease property to others ("lessor" contracts) and where we lease property from others ("lessee" contracts). We record acquisitions of and additions to equipment that we lease to others at cost. We depreciate equipment held for lease to estimated salvage value primarily using the straight-line method over estimated useful lives ranging from 3 to 35 years. We use declining balance depreciation methods for assets when the revenue-earning power of the asset is greater during the earlier years of its life. We also evaluate equipment held for lease for impairment consistent with policies for property, plant and equipment.

When we lease assets from others, we record right-of-use assets and lease liabilities. Right-of-use assets represent our right to use an underlying asset for the lease term and lease liabilities represent our obligation to make lease payments arising from the lease. In this regard, lease payments include fixed payments and variable payments that depend on an index or rate. The lease term is generally considered the non-cancellable lease period. Certain lease contracts contain renewal options or other terms that provide for variable payments based on performance or usage. Options are not included in determining right-of-use assets or lease liabilities unless it is reasonably certain that options will be exercised. Generally, incremental borrowing rates are used in measuring lease liabilities. Right-of-use assets are subject to review for impairment. As permitted under GAAP, we do not separate lease components from non-lease components by class of asset and do not record assets or liabilities for leases with terms of one year or less.

(n) Goodwill and other intangible assets

Goodwill represents the excess of the acquisition price of a business over the fair value of identified net assets of that business. We evaluate goodwill for impairment at least annually. When evaluating goodwill for impairment, we estimate the fair value of the reporting unit. Several methods may be used to estimate a reporting unit's fair value, including market quotations, asset and liability fair values and other valuation techniques, including, but not limited to, discounted projected future net earnings or net cash flows and multiples of earnings. When the carrying amount of a reporting unit, including goodwill, exceeds the estimated fair value, the excess is charged to earnings as an impairment loss.

Intangible assets with indefinite lives are also tested for impairment at least annually and when events or changes in circumstances indicate that, more-likely-than-not, the asset is impaired. Significant judgment is required in estimating fair values and performing goodwill and indefinite-lived intangible asset impairment tests. We amortize intangible assets with finite lives in a pattern that reflects the expected consumption of related economic benefits or on a straight-line basis over the estimated economic useful lives. Intangible assets with finite lives are reviewed for impairment when events or changes in circumstances indicate that the carrying amount may not be recoverable.

(1) Significant accounting policies and practices *(Continued)*

(o) Revenue recognition

We earn insurance premiums on prospective property/casualty insurance and reinsurance contracts over the loss exposure or coverage period in proportion to the level of protection provided. Premiums are generally earned in proportion to the coverage provided, which is generally ratable over the term of the contract with unearned premiums computed on a monthly or daily pro-rata basis. Premiums on retroactive property/casualty reinsurance contracts are generally received in full and are earned at the inception of the contracts, as all underlying loss events covered by the policies occurred prior to contract inception. Premiums for life reinsurance and periodic payment annuity contracts are earned when due. Premiums for periodic payment annuity contracts are usually received in full at the inception of the contracts. Premiums earned are stated net of amounts ceded to reinsurers. Premiums earned on contracts with experience-rating provisions reflect estimated loss experience under such contracts.

Sales and service revenues are recognized when goods or services are transferred to a customer. A good or service is transferred when (or as) the customer obtains control of that good or service. Revenues are based on the consideration we expect to receive in connection with our promises to deliver goods and services to our customers.

We manufacture and/or distribute a wide variety of industrial, building and consumer products. Our sales contracts provide customers with these products through wholesale and retail channels in exchange for consideration specified under the contracts. Contracts generally represent customer orders for individual products at stated prices. Sales contracts may contain either single or multiple performance obligations. In instances where contracts contain multiple performance obligations, we allocate the revenue to each obligation based on the relative stand-alone selling prices of each product or service.

Sales revenue reflects reductions for returns, allowances, volume discounts and other incentives, some of which may be contingent on future events. In certain customer contracts, sales revenue includes certain state and local excise taxes billed to customers on specified products when those taxes are levied directly upon us by the taxing authorities. Sales revenue excludes sales taxes and value-added taxes collected on behalf of taxing authorities. Sales revenue includes consideration for shipping and other fulfillment activities performed prior to the customer obtaining control of the goods. We also elect to treat consideration for such services performed after control has passed to the customer as sales revenue.

Our product sales revenues are generally recognized at a point in time when control of the product transfers to the customer, which coincides with customer pickup or product delivery or acceptance, depending on terms of the arrangement. We recognize sales revenues and related costs with respect to certain contracts over time, primarily from certain castings, forgings and aerostructures contracts. Control of the product units under these contracts transfers continuously to the customer as the product is manufactured. These products generally have no alternative use and the contract requires the customer to provide reasonable compensation if terminated for reasons other than breach of contract.

The primary performance obligation under our freight rail transportation service contracts is to move freight from a point of origin to a point of destination. The performance obligations are represented by bills of lading which create a series of distinct services that have a similar pattern of transfer to the customer. The revenues for each performance obligation are based on various factors including the product being shipped, the origin and destination pair and contract incentives, which are outlined in various private rate agreements, common carrier public tariffs, interline foreign road agreements and pricing quotes. The transaction price is generally a per car/unit amount to transport railcars from a specified origin to a specified destination. Freight revenues are recognized over time as the service is performed because the customer simultaneously receives and consumes the benefits of the service. Revenues recognized represent the proportion of the service completed as of the balance sheet date. Invoices for freight transportation services are generally issued to customers and paid within 30 days or less. Customer incentives, which are primarily provided for shipping a specified cumulative volume or shipping to/from specific locations, are recorded as a reduction to revenue on a pro-rata basis based on actual or projected future customer shipments.

(1) Significant accounting policies and practices *(Continued)*

(o) Revenue recognition (Continued)

Our energy revenue derives primarily from tariff-based sales arrangements approved by various regulatory commissions. These tariff-based revenues are mainly comprised of energy, transmission, distribution and natural gas and have performance obligations to deliver energy products and services to customers which are satisfied over time as energy is delivered or services are provided. Our nonregulated energy revenue primarily relates to our renewable energy business. Energy revenues are equivalent to the amounts we have the right to invoice and correspond directly with the value to the customer of the performance to date and include billed and unbilled amounts. Payments from customers are generally due within 30 days of billing. Rates charged for energy products and services are established by regulators or contractual arrangements that establish the transaction price, as well as the allocation of price among the separate performance obligations. When preliminary regulated rates are permitted to be billed prior to final approval by the applicable regulator, certain revenue collected may be subject to refund and a liability for estimated refunds is accrued. Other service revenues derive from contracts with customers in which performance obligations are satisfied over time, where customers receive and consume benefits as we perform the services or at a point in time when the services are provided. Other service revenues primarily derive from real estate brokerage, automotive repair, aircraft management, aviation training, franchising and news distribution.

Leasing revenue is generally recognized ratably over the term of the lease or based on usage, if applicable under the terms of the contract. A substantial portion of our lessor contracts are classified as operating leases.

(p) Losses and loss adjustment expenses

We record liabilities for unpaid losses and loss adjustment expenses under property/casualty insurance and reinsurance contracts for loss events that have occurred on or before the balance sheet date. Such liabilities represent the estimated ultimate payment amounts without discounting for time value.

We base liability estimates on (1) loss reports from policyholders and cedents, (2) individual case estimates and (3) estimates of incurred but not reported losses. Losses and loss adjustment expenses in the Consolidated Statements of Earnings include paid claims, claim settlement costs and changes in estimated claim liabilities. Losses and loss adjustment expenses charged to earnings are net of amounts recovered and estimates of amounts recoverable under ceded reinsurance contracts. Reinsurance contracts do not relieve the ceding company of its obligations to indemnify policyholders with respect to the underlying insurance and reinsurance contracts.

(q) Retroactive reinsurance contracts

We record liabilities for unpaid losses and loss adjustment expenses under short duration retroactive reinsurance contracts consistent with property/casualty insurance and reinsurance contracts described in Note 1(p). With respect to retroactive reinsurance contracts, we also record deferred charge assets at the inception of the contracts, representing the excess, if any, of the estimated ultimate claim liabilities over the premiums earned. We subsequently amortize the deferred charge assets over the expected claim settlement periods using the interest method. Changes to the estimated timing or amount of future loss payments also produce changes in deferred charge balances. We apply changes in such estimates retrospectively and the resulting changes in deferred charge balances, together with periodic amortization, are included in insurance losses and loss adjustment expenses in the Consolidated Statements of Earnings.

(r) Insurance policy acquisition costs

We capitalize the incremental costs that directly relate to the successful sale of insurance contracts, subject to ultimate recoverability. For short duration contracts, we subsequently amortize such costs to underwriting expenses as the related premiums are earned. Acquisition costs related to long duration life insurance contracts are amortized over the expected premium-paying period in proportion to the anticipated premiums over the life of the policy. Such anticipated premiums are estimated using the same assumptions used for computing liabilities for future policy benefits. Direct incremental acquisition costs include commissions, premium taxes and certain other costs associated with successful efforts. We expense all other underwriting costs as incurred. The recoverability of capitalized insurance policy acquisition costs generally reflects anticipation of investment income. The unamortized balances are included in other assets and were approximately \$3.4 billion and \$3.25 billion at December 31, 2021 and 2020, respectively.

(1) Significant accounting policies and practices *(Continued)*

(s) Life and annuity insurance benefits

We compute liabilities for benefits under life insurance contracts based upon estimated future investment yields, expected mortality, morbidity and lapse or withdrawal rates, as well as estimates of premiums we expect to receive and expenses we expect to incur in the future. These assumptions, as applicable, also include a margin for adverse deviation and may vary with the characteristics of the contract's date of issuance, policy duration and country of risk. The interest rate assumptions used may vary by contract or jurisdiction. We discount periodic payment annuity liabilities based on the implicit rate as of the inception of the contracts such that the present value of the liabilities equals the premiums. Discount rates for most contracts range from 3% to 7%.

(t) Regulated utilities and energy businesses

Certain energy subsidiaries prepare their financial statements in accordance with authoritative guidance for regulated operations, reflecting the economic effects of regulation from the ability to recover certain costs from customers and the requirement to return revenues to customers in the future through the regulated rate-setting process. Accordingly, certain costs are deferred as regulatory assets and certain income is accrued as regulatory liabilities. Regulatory assets and liabilities will be amortized into operating expenses and revenues over various future periods.

Regulatory assets and liabilities are continually assessed for probable future inclusion in regulatory rates by considering factors such as applicable regulatory or legislative changes and recent rate orders received by other regulated entities. If future inclusion in regulatory rates ceases to be probable, the amount no longer probable of inclusion in regulatory rates is charged or credited to earnings (or other comprehensive income, if applicable) or returned to customers.

(u) Foreign currency

The accounts of our non-U.S. based subsidiaries are measured, in most instances, using functional currencies other than the U.S. Dollar. Revenues and expenses in the financial statements of these subsidiaries are translated into U.S. Dollars at the average exchange rate for the period and assets and liabilities are translated at the exchange rate as of the end of the reporting period. The net effects of translating the financial statements of these subsidiaries are included in shareholders' equity as a component of accumulated other comprehensive income. Gains and losses arising from transactions denominated in a currency other than the functional currency of the reporting entity, including gains and losses from the remeasurement of assets and liabilities due to changes in currency exchange rates, are included in earnings.

(v) Income taxes

Berkshire files a consolidated federal income tax return in the United States, which includes eligible subsidiaries. In addition, we file income tax returns in state, local and foreign jurisdictions as applicable. Provisions for current income tax liabilities are calculated and accrued on income and expense amounts expected to be included in the income tax returns for the current year. Income taxes reported in earnings also include deferred income tax provisions.

Deferred income tax assets and liabilities are computed on differences between the financial statement bases and tax bases of assets and liabilities at the enacted tax rates. Changes in deferred income tax assets and liabilities associated with components of other comprehensive income are charged or credited directly to other comprehensive income. Otherwise, changes in deferred income tax assets and liabilities are included as a component of income tax expense. The effect on deferred income tax assets and liabilities attributable to changes in enacted tax rates are charged or credited to income tax expense in the period of enactment. Valuation allowances are established for certain deferred tax assets when realization is not likely.

Assets and liabilities are established for uncertain tax positions taken or positions expected to be taken in income tax returns when such positions, in our judgment, do not meet a more-likely-than-not threshold based on the technical merits of the positions. Estimated interest and penalties related to uncertain tax positions are included as a component of income tax expense.

(1) Significant accounting policies and practices *(Continued)*

(w) New accounting pronouncements adopted in 2020

We adopted Accounting Standards Codification ("ASC") 326 "Financial Instruments-Credit Losses" on January 1, 2020. ASC 326 provides for the measurement of expected credit losses on financial assets that are carried at amortized cost based on the net amounts expected to be collected. Measurements of expected credit losses therefore include provisions for non-collection, whether the risk is probable or remote. Prior to the adoption of ASC 326, credit losses were measured when non-collection was considered probable. Upon adoption of ASC 326, we recorded a charge to retained earnings of $388 million representing the cumulative after-tax increase in our allowances for credit losses.

(x) New accounting pronouncements adopted in 2019

Berkshire adopted ASC 842 "Leases" on January 1, 2019 with respect to contracts in effect as of the adoption and elected to not restate prior period financial statements. Most significantly, ASC 842 requires a lessee to recognize a liability to make operating lease payments and an asset with respect to its right to use the underlying asset for the lease term. Upon adoption, we recorded operating lease right-of-use assets of approximately $6.2 billion, lease liabilities of $5.9 billion and reduced other assets by approximately $300 million.

(y) New accounting pronouncements to be adopted subsequent to December 31, 2021

In August 2018, the Financial Accounting Standards Board issued Accounting Standards Update 2018-12 "Targeted Improvements to the Accounting for Long-Duration Contracts" ("ASU 2018-12"). ASU 2018-12 requires reassessment of cash flow assumptions at least annually and revision of discount rate assumptions each reporting period in valuing policyholder liabilities and related deferred acquisition costs of long-duration insurance and reinsurance contracts. The effects from changes in cash flow assumptions are reflected in earnings and the effects from changes in discount rate assumptions are reflected in other comprehensive income. Currently, the cash flow and discount rate assumptions are set at the contract inception date and not subsequently changed, except under limited circumstances. ASU 2018-12 is to be applied retrospectively to the earliest period presented in the financial statements, requires new disclosures and is effective for fiscal years beginning after December 15, 2022, with early adoption permitted.

We currently intend to adopt ASU 2018-12 as of January 1, 2023 using the modified retrospective method, which provides that the revised cash flow and discount rate assumptions as of January 1, 2021 (the transition date) be applied to contracts then in-force, with liabilities then remeasured as provided under the standard. The cumulative effects from discount rate assumption changes as of the transition date will be reflected in accumulated other comprehensive income and the cumulative effect from cash flow assumption changes will be included in retained earnings. While we have not finalized our assessment of the impact of the adoption as of the transition date, we currently believe that the changes in discount rate assumptions will have a greater effect on our recorded liabilities than changes in cash flow assumptions. We also preliminarily estimate that the changes in discount rate assumptions as of January 1, 2021 will increase our life, health and annuity benefit liabilities from the amounts previously reported due to the historically low interest rate environment at that time. However, the ultimate impact of adopting ASU 2018-12 will be based on the discount rate and cash flow assumptions determined as of the January 1, 2023 adoption date. We, therefore, continue to evaluate the effect this standard will have on our Consolidated Financial Statements.

(2) Business acquisitions

Our long-held acquisition strategy is to acquire businesses that have consistent earning power, good returns on equity and able and honest management. Financial results attributable to business acquisitions are included in our Consolidated Financial Statements beginning on their respective acquisition dates.

Berkshire Hathaway Energy ("BHE") acquired certain businesses of Dominion Energy, Inc. ("Dominion") on November 1, 2020, pursuant to a definitive agreement with Dominion in July 2020. The acquired businesses included natural gas transmission, gathering and storage pipelines, natural gas storage capacity and partial ownership of a liquefied natural gas export, import and storage facility ("Cove Point"). In October 2020, BHE and Dominion also agreed to provide for the exclusion of certain pipeline businesses from the initial agreement and entered into a second acquisition agreement with respect to the excluded pipeline businesses. The closing of the second agreement was subject to regulatory and customary closing conditions; however, in July 2021, BHE and Dominion agreed to terminate the second agreement.

(2) Business acquisitions *(Continued)*

The cost of the acquisition was approximately $2.5 billion after post-closing adjustments as provided in the agreement. The fair values of identified assets acquired and liabilities assumed and residual goodwill are summarized as follows (in millions).

Property, plant and equipment	$	9,264
Goodwill		1,741
Other		2,398
Assets acquired	$	13,403
Notes payable and other borrowings	$	5,615
Other		1,358
Liabilities assumed		6,973
Noncontrolling interests		3,916
Net assets	$	2,514

As part of this acquisition, BHE acquired an indirect 25% economic interest in Cove Point, consisting of 100% of the general partnership interest and 25% of the limited partnership interests. We concluded that Cove Point is a VIE and that we have the power to direct the activities that most significantly impact its economic performance as well as the obligation to absorb losses and receive benefits which could be significant to Cove Point. Therefore, we treat Cove Point as a consolidated subsidiary. The noncontrolling interests are attributable to the limited partner interests held by third parties.

In each of the past three years, we also completed several smaller-sized business acquisitions, which we consider as "bolt-ons" to several of our existing business operations. We do not believe that these acquisitions are material, individually or in the aggregate to our Consolidated Financial Statements.

(3) Investments in fixed maturity securities

Investments in fixed maturity securities as of December 31, 2021 and 2020 are summarized by type below (in millions).

	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
December 31, 2021				
U.S. Treasury, U.S. government corporations and agencies	$ 3,286	$ 22	$ (5)	$ 3,303
Foreign governments	10,998	29	(33)	10,994
Corporate bonds	1,363	412	(1)	1,774
Other	317	47	(1)	363
	$ 15,964	$ 510	$ (40)	$ 16,434
December 31, 2020				
U.S. Treasury, U.S. government corporations and agencies	$ 3,348	$ 55	$ —	$ 3,403
Foreign governments	11,233	110	(5)	11,338
Corporate bonds	4,729	464	(2)	5,191
Other	414	66	(2)	478
	$ 19,724	$ 695	$ (9)	$ 20,410

Investments in foreign governments include securities issued by national and provincial government entities as well as instruments that are unconditionally guaranteed by such entities. As of December 31, 2021, approximately 93% of our foreign government holdings were rated AA or higher by at least one of the major rating agencies. The amortized cost and estimated fair value of fixed maturity securities at December 31, 2021 are summarized below by contractual maturity dates. Amounts are in millions. Actual maturities may differ from contractual maturities due to prepayment rights held by issuers.

	Due in one year or less	Due after one year through	Due after five years through	Due after ten years	Mortgage-backed	Total

		five years	ten years		securities	
Amortized cost	$ 9,171	$ 6,044	$ 307	$ 207	$ 235	$15,964
Fair value	9,165	6,086	559	347	277	16,434

(4) Investments in equity securities

Investments in equity securities as of December 31, 2021 and 2020 are summarized based on the primary industry of the investee in the table below (in millions).

	Cost Basis	Net Unrealized Gains	Fair Value
December 31, 2021 *			
Banks, insurance and finance	$ 26,822	$ 62,236	$ 89,058
Consumer products	36,076	154,945	191,021
Commercial, industrial and other	41,707	28,933	70,640
	$ 104,605	$ 246,114	$ 350,719

* *Approximately 73% of the aggregate fair value was concentrated in four companies (American Express Company – $24.8 billion; Apple Inc. – $161.2 billion; Bank of America Corporation – $46.0 billion and The Coca-Cola Company – $23.7 billion).*

	Cost Basis	Net Unrealized Gains	Fair Value
December 31, 2020 *			
Banks, insurance and finance	$ 26,312	$ 40,167	$ 66,479
Consumer products	34,747	111,583	146,330
Commercial, industrial and other	47,561	20,800	68,361
	$ 108,620	$ 172,550	$ 281,170

* *Approximately 68% of the aggregate fair value was concentrated in four companies (American Express Company – $18.3 billion; Apple Inc. – $120.4 billion; Bank of America Corporation – $31.3 billion and The Coca-Cola Company – $21.9 billion).*

Investments in commercial, industrial and other equity securities include our investments in Occidental Corporation ("Occidental"), which we acquired in 2019. These investments were acquired for a total of $10 billion and consist of Occidental Cumulative Perpetual Preferred Stock with an aggregate liquidation value of $10 billion and warrants, which currently permit us to purchase up to 83.86 million shares of Occidental common stock at an exercise price of $59.62 per share. The preferred stock accrues dividends at 8% per annum and is redeemable at the option of Occidental commencing in 2029 at a redemption price equal to 105% of the liquidation preference plus any accumulated and unpaid dividends and is mandatorily redeemable under certain specified events. The warrants are exercisable in whole or in part until one year after the redemption of the preferred stock.

(5) Equity method investments

Berkshire and its subsidiaries hold investments in certain businesses that are accounted for pursuant to the equity method. Currently, the most significant of these is our investment in the common stock of The Kraft Heinz Company ("Kraft Heinz"). Kraft Heinz is one of the world's largest manufacturers and marketers of food and beverage products, including condiments and sauces, cheese and dairy, meals, meats, refreshment beverages, coffee and other grocery products. Berkshire currently owns 26.6% of the outstanding shares of Kraft Heinz common stock.

We recorded equity method earnings from our investment in Kraft Heinz of $269 million in 2021, $95 million in 2020 and $493 million in 2019. Equity method earnings included the effects of goodwill and identifiable intangible asset impairment charges recorded by Kraft Heinz. Our share of such charges was approximately $350 million in 2021, $850 million in 2020 and $450 million in 2019. We received dividends from Kraft Heinz of $521 million in each of 2021, 2020 and 2019, which we recorded as reductions in our carrying value.

Shares of Kraft Heinz common stock are publicly-traded and the fair value of our investment was approximately $11.7 billion at December 31, 2021 and $11.3 billion at December 31, 2020. The carrying value of our investment was approximately $13.1 billion at December 31, 2021 and $13.3 billion at December 31, 2020. As of December 31, 2021, the carrying value of our investment exceeded the fair value based on the quoted market price by approximately 11% of the carrying value. We evaluated our investment in Kraft Heinz for impairment. Based on the prevailing facts and circumstances, we concluded recognition of an impairment charge in earnings was not required as of December 31, 2021.

(5) Equity method investments *(Continued)*

Summarized consolidated financial information of Kraft Heinz follows (in millions).

	December 25, 2021	December 26, 2020
Assets	$ 93,394	$ 99,830
Liabilities	43,942	49,587

	Year ending December 25, 2021	Year ending December 26, 2020	Year ending December 28, 2019
Sales	$ 26,042	$ 26,185	$ 24,977
Net earnings attributable to Kraft Heinz common shareholders	$ 1,012	$ 356	$ 1,935

Other investments accounted for pursuant to the equity method include our investments in Berkadia Commercial Mortgage LLC (“Berkadia”), Pilot Travel Centers LLC (“Pilot”), Electric Transmission Texas, LLC (“ETT”) and beginning in 2021, Iroquois Gas Transmission System L.P. (“Iroquois”). The aggregate carrying value of our investments in these entities was $4.3 billion as of December 31, 2021 and $4.0 billion as of December 31, 2020. Our equity method earnings in these entities were $726 million in 2021, $631 million in 2020 and $683 million in 2019. During 2021, we received distributions of approximately $1.2 billion from these investees. Additional information concerning these investments follows.

We own a 50% interest in Berkadia, with Jefferies Financial Group Inc. (“Jefferies”) owning the other 50% interest. Berkadia is a servicer of commercial real estate loans in the U.S., performing primary, master and special servicing functions for U.S. government agency programs, commercial mortgage-backed securities transactions, banks, insurance companies and other financial institutions. Berkadia funds a portion of its operations through commercial paper borrowings, which are currently limited to $1.5 billion. On December 31, 2021, Berkadia’s commercial paper outstanding was $1.47 billion. Berkadia’s commercial paper is supported by a surety policy issued by a Berkshire insurance subsidiary. Jefferies is obligated to indemnify us for one-half of any losses incurred under the policy. BHE subsidiaries own a 50% noncontrolling interest in ETT, an owner and operator of electric transmission assets in Texas and a 50% noncontrolling interest in Iroquois, which owns and operates a natural gas pipeline located in New York and Connecticut.

We own a 38.6% interest in Pilot, headquartered in Knoxville, Tennessee. Pilot is the largest operator of travel centers in North America with more than 800 retail locations across 44 U.S. states and six Canadian provinces and through wholesale distribution. Pilot’s revenues in 2021 were approximately $45 billion. The Haslam family currently owns a 50.1% interest in Pilot and a third party owns the remaining 11.3% interest. We have an agreement to acquire in 2023 an additional 41.4% interest in Pilot with the Haslam family retaining a 20% interest. As a result, Berkshire will become the majority owner of Pilot in 2023.

(6) Investment and derivative contract gains/losses

Investment and derivative contract gains/losses for each of the three years ending December 31, 2021 are summarized as follows (in millions).

	2021	2020	2019
Investment gains (losses):			
Equity securities:			
Change in unrealized investment gains (losses) during the year on securities held at the end of the year	$ 76,375	$ 54,951	$ 69,581
Investment gains (losses) during the year on securities sold	997	(14,036)	1,585

	77,372	40,915	71,166
Fixed maturity securities:			
Gross realized gains	85	56	87
Gross realized losses	(29)	(27)	(25)
Other	148	(39)	(105)
Investment gains (losses)	77,576	40,905	71,123
Derivative contract gains (losses)	966	(159)	1,484
	$ 78,542	$ 40,746	$ 72,607

(6) Investment and derivative contract gains/losses *(Continued)*

Equity securities gains and losses include unrealized gains and losses from changes in fair values during the year on equity securities we still owned at the end of the year, as well as gains and losses on securities we sold during the year. As reflected in the Consolidated Statements of Cash Flows, we received proceeds of approximately $15.8 billion in 2021, $38.8 billion in 2020 and $14.3 billion in 2019 from sales of equity securities. In the preceding table, investment gains and losses on equity securities sold during the year represent the difference between the sales proceeds and the fair value of the equity securities sold at the beginning of the applicable year or, if later, the purchase date. Our taxable gains and losses on equity securities sold are generally the difference between the proceeds from sales and original cost. Taxable gains were $3.6 billion in 2021, $6.2 billion in 2020 and $3.2 billion in 2019.

The derivative contract gains and losses derive from equity index put option contracts written prior to March 2008 on four major equity indexes. Information related to these contracts follows (dollars in millions).

	December 31,	
	2021	2020
Balance sheet liabilities - at fair value	$ 99	$ 1,065
Notional value	6,992	10,991
Intrinsic value	—	727
Weighted average remaining life (in years)	0.5	1.2

Notional value in the preceding table represents the aggregate undiscounted amounts payable assuming the value of each index is zero on each contract's expiration date. Intrinsic value is the undiscounted liability assuming the contracts are settled based on the index values and foreign currency exchange rates as of the balance sheet date. Contracts comprising 63% of the notional value as of December 31, 2021 will expire in the first quarter of 2022. Future payments, if any, under any given contract will be required if the index value is below the contract strike price at the contract expiration date. We received aggregate premiums on the contract inception dates of $1.3 billion with respect to unexpired contracts as of December 31, 2021 and we have no counterparty credit risk.

(7) Loans and finance receivables

Loans and finance receivables are summarized as follows (in millions).

	December 31,	
	2021	2020
Loans and finance receivables before allowances and discounts	$ 22,065	$ 20,436
Allowances for credit losses	(765)	(712)
Unamortized acquisition discounts and points	(549)	(523)
	$ 20,751	$ 19,201

Loans and finance receivables are principally manufactured home loans, and to a lesser extent, commercial loans and site-built home loans. Reconciliations of the allowance for credit losses on loans and finance receivables for 2021, 2020 and 2019 follow (in millions).

	2021	2020	2019
Balance at beginning of year	$ 712	$ 167	$ 177
Adoption of ASC 326	—	486	—
Provision for credit losses	88	177	125
Charge-offs, net of recoveries	(35)	(118)	(135)
Balance at December 31	$ 765	$ 712	$ 167

At December 31, 2021, approximately 99% of manufactured and site-built home loan balances were evaluated collectively for impairment. At December 31, 2021, we considered approximately 97% of the loan balances to be current as to payment status. A summary of performing and non-performing home loans before discounts and allowances by year of loan origination as of December 31, 2021 follows (in millions).

	Origination Year						
	2021	2020	2019	2018	2017	Prior	Total
Performing	$ 4,898	$ 3,164	$ 2,238	$ 1,694	$ 1,259	$ 6,842	$ 20,095
Non-performing	4	5	6	7	5	40	67
Total	$ 4,902	$ 3,169	$ 2,244	$ 1,701	$ 1,264	$ 6,882	$ 20,162

(7) Loans and finance receivables *(Continued)*

We are also party to commercial loan agreements with Seritage Growth Properties ("Seritage") and Lee Enterprises, Inc, ("Lee"), in which loan balances aggregated $1.9 billion at December 31, 2021 and $2.1 billion at December 31, 2020. The Seritage loan is pursuant to a $2.0 billion term loan facility and the outstanding loan is secured by mortgages on its real estate properties. During the fourth quarter of 2021, the loan agreement with Seritage was amended to allow optional loan prepayments without penalty and on December 31, 2021, Seritage made a loan prepayment of $160 million. The amendments further provide Seritage with the option to extend the maturity of the loan to July 31, 2025, if the outstanding principal has been reduced to $800 million by the original expiration date of July 31, 2023. The loan to Lee matures in 2045 and was made in connection with its acquisition of our newspaper operations and the repayment by Lee of its then outstanding credit facilities. We are the sole lender to each of these entities and each of these loans is current as to payment status.

(8) Other receivables

Other receivables are comprised of the following (in millions).

	December 31, 2021	December 31, 2020
Insurance and other:		
Insurance premiums receivable	$ 15,050	$ 14,025
Reinsurance recoverables	4,900	4,805
Trade receivables	12,971	11,521
Other	3,146	2,637
Allowances for credit losses	(679)	(678)
	$ 35,388	$ 32,310
Railroad, utilities and energy:		
Trade receivables	$ 3,678	$ 3,235
Other	650	438
Allowances for credit losses	(151)	(131)
	$ 4,177	$ 3,542

Provisions for credit losses with respect to receivables summarized above were $441 million in 2021, $564 million in 2020 and $363 million in 2019. Charge-offs, net of recoveries, were $420 million in 2021, $401 million in 2020 and $350 million in 2019.

(9) Inventories

Inventories are comprised of the following (in millions).

	December 31, 2021	December 31, 2020
Raw materials	$ 5,743	$ 4,821
Work in process and other	3,192	2,541
Finished manufactured goods	4,530	4,412
Goods acquired for resale	7,489	7,434

	$ 20,954	$ 19,208

(10) Property, plant and equipment

A summary of property, plant and equipment of our insurance and other businesses follows (in millions).

	December 31, 2021	December 31, 2020
Land, buildings and improvements	$ 14,070	$ 13,799
Machinery and equipment	26,063	25,488
Furniture, fixtures and other	4,640	4,530
	44,773	43,817
Accumulated depreciation	(23,939)	(22,617)
	$ 20,834	$ 21,200

(10) Property, plant and equipment *(Continued)*

A summary of property, plant and equipment of railroad and utilities and energy businesses follows (in millions). The utility generation, transmission and distribution systems and interstate natural gas pipeline assets are owned by regulated public utility and natural gas pipeline subsidiaries.

	December 31, 2021	December 31, 2020
Railroad:		
Land, track structure and other roadway	$ 65,843	$ 63,824
Locomotives, freight cars and other equipment	13,822	13,523
Construction in progress	1,027	916
	80,692	78,263
Accumulated depreciation	(14,978)	(13,175)
	65,714	65,088
Utilities and energy:		
Utility generation, transmission and distribution systems	90,223	86,730
Interstate natural gas pipeline assets	17,423	16,667
Independent power plants and other assets	13,695	12,671
Construction in progress	4,196	3,308
	125,537	119,376
Accumulated depreciation	(35,721)	(33,248)
	89,816	86,128
	$ 155,530	$ 151,216

Depreciation expense for each of the three years ending December 31, 2021 is summarized below (in millions).

	2021	2020	2019
Insurance and other	$ 2,318	$ 2,320	$ 2,269
Railroad, utilities and energy	5,990	5,799	5,297
	$ 8,308	$ 8,119	$ 7,566

(11) Equipment held for lease

Equipment held for lease includes railcars, aircraft, over-the-road trailers, intermodal tank containers, cranes, storage units and furniture. Equipment held for lease is summarized below (in millions).

	December 31, 2021	December 31, 2020
Railcars	$ 9,448	$ 9,402
Aircraft	9,234	8,204
Other	5,053	4,868
	23,735	22,474
Accumulated depreciation	(8,817)	(7,873)
	$ 14,918	$ 14,601

Depreciation expense for equipment held for lease was $1,158 million in 2021, $1,200 million in 2020 and $1,181 million in 2019. Fixed and variable operating lease revenues for each of the three years ending December 31, 2021 are summarized below (in millions).

	2021	2020	2019
Fixed lease revenue	$ 4,482	$ 4,262	$ 4,415
Variable lease revenue	1,506	947	1,441

	$ 5,988	$ 5,209	$ 5,856

(11) Equipment held for lease *(Continued)*

A summary of future operating lease receipts as of December 31, 2021 follows (in millions).

2022	2023	2024	2025	2026	Thereafter	Total
$ 2,922	$ 2,233	$ 1,623	$ 1,009	$ 536	$ 392	$ 8,715

(12) Leases

We are party to contracts where we lease property from others under contracts classified as operating leases. We primarily lease office and operating facilities, locomotives, freight cars, energy generation facilities and transmission assets. The weighted average remaining term of our operating leases was approximately 7.2 years at December 31, 2021 and 7.3 years at December 31, 2020. Operating lease right-of-use assets are included in other assets and were $5,091 million at December 31, 2021 and $5,579 million at December 31, 2020. Our lease liabilities are included in accounts payable, accruals and other liabilities and were $4,991 million at December 31, 2021 and $5,469 million at December 31, 2020. The weighted average discount rate used to measure lease liabilities was approximately 3.5% at December 31, 2021 and 3.6% at December 31, 2020. A summary of our remaining future operating lease payments reconciled to lease liabilities as of December 31, 2021 and December 31, 2020 follows (in millions).

	Year 1	Year 2	Year 3	Year 4	Year 5	Thereafter	Total lease payments	Amount representing interest	Lease liabilities
December 31:									
2021	$ 1,238	$ 1,038	$ 835	$ 631	$ 418	$ 1,571	$ 5,731	$ (740)	$ 4,991
2020	1,342	1,111	905	725	544	1,691	6,318	(849)	5,469

Components of operating lease costs for the three years ending December 31, 2021, by type, are summarized in the following table (in millions).

	2021	2020	2019
Operating lease cost	$ 1,426	$ 1,413	$ 1,459
Short-term lease cost	154	145	178
Variable lease cost	223	228	276
Sublease income	(10)	(10)	(24)
Total lease cost	$ 1,793	$ 1,776	$ 1,889

(13) Goodwill and other intangible assets

Reconciliations of the changes in the carrying value of goodwill during 2021 and 2020 follow (in millions).

	December 31,	
	2021	2020
Balance at beginning of year	$ 73,734	$ 81,882
Business acquisitions	353	1,758
Impairment charges	—	(10,033)
Other, including foreign currency translation	(212)	127
Balance at end of year*	$ 73,875	$ 73,734

* *Net of accumulated goodwill impairments of $11.0 billion as of December 31, 2021 and 2020.*

During 2020, we reevaluated goodwill and indefinite-lived intangible assets of certain of our reporting units for impairment due to the disruptions arising from the COVID-19 pandemic, which we believed most significantly affected the air travel, commercial aerospace and supporting industries. We recorded goodwill impairment charges of approximately $10 billion and indefinite-lived intangible asset impairment charges of $638 million in the second quarter of 2020. Approximately $10 billion of these charges pertained to Precision Castparts Corp. ("PCC"), one of the largest businesses within Berkshire's manufacturing segment. The carrying values of PCC-related goodwill and indefinite-lived intangible assets prior to the impairment charges were approximately $31 billion. The impairment charges were determined based on discounted cash flow methods and reflected our assessments of the risks and uncertainties associated with the aerospace industry. Significant judgment is required in estimating the fair value of a reporting unit and in performing impairment tests. Due to the inherent uncertainty in forecasting future cash flows and earnings, actual results in the future may vary significantly from the forecasts.

(13) Goodwill and other intangible assets *(Continued)*

The gross carrying amounts and related accumulated amortization of other intangible assets are summarized as follows (in millions).

	December 31, 2021			December 31, 2020		
	Gross carrying amount	Accumulated amortization	Net carrying value	Gross carrying amount	Accumulated amortization	Net carrying value
Insurance and other:						
Customer relationships	$ 27,335	$ 6,450	$ 20,885	$ 27,374	$ 5,756	$ 21,618
Trademarks and trade names	5,176	802	4,374	5,206	779	4,427
Patents and technology	4,763	3,484	1,279	4,766	3,313	1,453
Other	3,390	1,442	1,948	3,339	1,375	1,964
	$ 40,664	$ 12,178	$ 28,486	$ 40,685	$ 11,223	$ 29,462
Railroad, utilities and energy:						
Customer relationships	$ 678	$ 396	$ 282	$ 678	$ 361	$ 317
Trademarks, trade names and other	1,015	146	869	1,003	98	905
	$ 1,693	$ 542	$ 1,151	$ 1,681	$ 459	$ 1,222

Intangible asset amortization expense was $1,252 million in 2021, $1,277 million in 2020 and $1,317 million in 2019. Estimated amortization expense over the next five years is as follows (in millions): 2022 – $1,189; 2023 – $1,120; 2024 – $1,023; 2025 – $939 and 2026 – $846. Intangible assets with indefinite lives were $18.5 billion as of December 31, 2021 and $18.3 billion as of December 31, 2020 and primarily related to certain customer relationships and trademarks and trade names.

(14) Supplemental cash flow information

A summary of supplemental cash flow information for each of the three years ending December 31, 2021 is presented in the following table (in millions).

	2021	2020	2019
Cash paid during the year for:			
Income taxes	$ 5,412	$ 5,001	$ 5,415
Interest:			
Insurance and other	1,227	1,001	1,011
Railroad, utilities and energy	3,162	3,006	2,879
Non-cash investing and financing activities:			
Liabilities assumed in connection with business acquisitions	102	6,981	766
Operating lease liabilities arising from obtaining right-of-use assets	687	729	782

(15) Dividend restrictions – Insurance subsidiaries

Payments of dividends by our insurance subsidiaries are restricted by insurance statutes and regulations. Without prior regulatory approval, our principal insurance subsidiaries may declare up to approximately $30 billion as ordinary dividends during 2022. Investments in fixed maturity and equity securities and short-term investments on deposit with U.S. state insurance authorities in accordance with state insurance regulations were approximately $6.4 billion at December 31, 2021 and $5.5 billion at December 31, 2020.

Combined shareholders' equity of U.S. based insurance subsidiaries determined pursuant to statutory accounting rules (Surplus as Regards Policyholders) was approximately $301 billion at December 31, 2021 and $237 billion at December 31, 2020. Statutory surplus differs from the corresponding amount based on GAAP, due to differences in accounting for certain assets and liabilities. For instance, deferred charges reinsurance assumed, deferred policy acquisition costs, unrealized gains on certain investments and related deferred income taxes are recognized for GAAP but not for statutory reporting purposes. In addition, the carrying values of certain assets, such as goodwill and non-insurance entities owned by our insurance subsidiaries, are not fully recognized for statutory reporting purposes.

(16) Unpaid losses and loss adjustment expenses

Our liabilities for unpaid losses and loss adjustment expenses (also referred to as "claim liabilities") under property and casualty insurance and reinsurance contracts are based upon estimates of the ultimate claim costs associated with claim occurrences as of the balance sheet date and include estimates for incurred-but-not-reported ("IBNR") claims. A reconciliation of the changes in claim liabilities, excluding liabilities under retroactive reinsurance contracts (see Note 17), for each of the three years ending December 31, 2021 is as follows (in millions).

	2021	2020	2019
Balances at beginning of year:			
Gross liabilities	$ 79,854	$ 73,019	$ 68,458
Reinsurance recoverable on unpaid losses	(2,912)	(2,855)	(3,060)
Net liabilities	76,942	70,164	65,398
Incurred losses and loss adjustment expenses:			
Current accident year	52,099	43,400	43,335
Prior accident years	(3,116)	(356)	(752)
Total	48,983	43,044	42,583
Paid losses and loss adjustment expenses:			
Current accident year	(22,897)	(17,884)	(19,482)
Prior accident years	(18,904)	(18,862)	(17,642)
Total	(41,801)	(36,746)	(37,124)
Foreign currency effect	(420)	480	(23)
Business acquisition (disposition)	—	—	(670)
Balances at December 31:			
Net liabilities	83,704	76,942	70,164
Reinsurance recoverable on unpaid losses	2,960	2,912	2,855
Gross liabilities	$ 86,664	$ 79,854	$ 73,019

Incurred losses and loss adjustment expenses shown in the preceding table were recorded in earnings and related to insured events occurring in the current year ("current accident year") and events occurring in all prior years ("prior accident years"). Incurred and paid losses and loss adjustment expenses are net of reinsurance recoveries. Current accident year incurred losses included approximately $2.9 billion in 2021, $950 million in 2020 and $1.0 billion in 2019 from significant catastrophe events (losses in excess of $100 million per event) occurring in the respective year. Current accident year incurred losses from private passenger auto insurance also increased significantly in 2021 as compared to 2020, primarily due to increased claims frequencies and severities. In 2020, current accident year incurred losses reflected low private passenger auto claims frequencies and increased loss estimates for certain commercial insurance and reinsurance business attributable to the COVID-19 pandemic.

We recorded net reductions of estimated ultimate liabilities for prior accident years of $3.1 billion in 2021, $356 million in 2020 and $752 million in 2019, which produced corresponding reductions in incurred losses and loss adjustment expenses in those periods. These reductions, as percentages of the net liabilities at the beginning of each year, were 4.0% in 2021, 0.5% in 2020 and 1.1% in 2019.

Estimated ultimate liabilities for prior accident years from primary insurance were reduced by $2.4 billion in 2021, $518 million in 2020 and $457 million in 2019. The reductions in 2021 and 2020 derived primarily from private passenger auto and medical professional liability claims. In both 2021 and 2020, we also lowered estimated ultimate liabilities for prior accident years with respect to workers' compensation claims, which were largely offset by increases in ultimate liabilities for other casualty claims. The decrease in incurred losses for prior accident years in 2019 reflected reductions in medical professional liability and workers' compensation estimates partially offset by higher other casualty estimates. Estimated ultimate liabilities for prior accident years related to property and casualty reinsurance decreased $718 million in 2021, increased $162 million in 2020 and decreased $295 million in 2019. The increase in 2020 included increased claims estimates for legacy casualty exposures.

(16) Unpaid losses and loss adjustment expenses *(Continued)*

Estimated net claim liabilities for environmental, asbestos and other latent injury exposures were approximately $2.1 billion at December 31, 2021 and 2020. These liabilities are subject to change due to changes in the legal and regulatory environment. We are unable to reliably estimate additional losses or a range of losses that are reasonably possible for these claims.

Disaggregated information concerning our claims liabilities is provided below and in the pages that follow. The effects of businesses acquired or disposed during the year are reflected in the data presented on a retrospective basis. A reconciliation of the disaggregated net unpaid losses and allocated loss adjustment expenses (the latter referred to as "ALAE") of GEICO, Berkshire Hathaway Primary Group ("BH Primary") and Berkshire Hathaway Reinsurance Group ("BHRG") to our consolidated unpaid losses and loss adjustment expenses as of December 31, 2021 follows (in millions).

	GEICO Physical Damage	GEICO Auto Liability	BH Primary Medical Professional Liability	BH Primary Workers' Compensation and Other Casualty	BHRG Property	BHRG Casualty	Total
Unpaid losses and ALAE, net	$ 729	$ 19,768	$ 8,506	$ 13,579	$ 13,119	$ 23,611	$ 79,312
Reinsurance recoverable	11	1,085	28	639	181	892	2,836
Unpaid unallocated loss adjustment expenses							2,448
Other unpaid losses and loss adjustment expenses							2,068
Unpaid losses and loss adjustment expenses							$ 86,664

GEICO

GEICO's claim liabilities predominantly relate to various types of private passenger auto liability and physical damage claims. For such claims, we establish and evaluate unpaid claim liabilities using standard actuarial loss development methods and techniques. The actuarial methods utilize historical claims data, adjusted when deemed appropriate to reflect perceived changes in loss patterns. Claim liabilities include average, case, case development and IBNR estimates.

We establish average liabilities based on expected severities for newly reported physical damage and liability claims prior to establishing individual case reserves when insufficient time or information is available for specific claim estimates and for large volumes of minor physical damage claims that once reported are quickly settled. We establish case loss estimates for liability claims, including estimates for loss adjustment expenses, as the facts and merits of the claim are evaluated.

Claim estimates for liability coverages normally reflect greater uncertainty than physical damage coverages, primarily due to the longer claim-tails, the greater chance of litigation and the time needed to evaluate facts at the time the case estimate is first established. The "claim-tail" is the period between the claim occurrence date and claim settlement or payment date. Consequently, we establish additional case development liabilities, which are usually percentages of the case liabilities. For unreported claims, IBNR liabilities are estimated by projecting the ultimate number of claims expected (reported and unreported) for each significant coverage and deducting reported claims to produce estimated unreported claims. The product of the average cost per unreported claim and the number of unreported claims produces the IBNR liability estimate. We may record supplemental IBNR liabilities in certain situations when actuarial techniques are difficult to apply.

(16) Unpaid losses and loss adjustment expenses *(Continued)*

GEICO's net incurred and paid auto physical damage and liability losses and ALAE are summarized by accident year below. IBNR and case development liabilities are as of December 31, 2021. Claim counts are established when accidents that may result in a liability are reported and are based on policy coverage. Each claim event may generate claims under multiple coverages, and thus may result in multiple counts. The "Cumulative Number of Reported Claims" includes the combined number of reported claims for all auto policy coverages. Dollars are in millions.

Physical Damage

Accident Year	Incurred Losses and ALAE through December 31, 2020*	2021	IBNR and Case Development Liabilities	Cumulative Number of Reported Claims (in thousands)
2020	$ 8,603	$ 8,396	$ 64	7,935
2021		12,135	420	8,967
Incurred losses and ALAE		$ 20,531		

Accident Year	Cumulative Paid Losses and ALAE through December 31, 2020*	2021
2020	$ 8,118	$ 8,385
2021		11,427
Paid losses and ALAE		19,812
Net unpaid losses and ALAE for 2020 – 2021 accident years		719
Net unpaid losses and ALAE for accident years before 2020		10
Net unpaid losses and ALAE		$ 729

Auto Liability

Accident Year	Incurred Losses and ALAE through December 31, 2017*	2018*	2019*	2020*	2021	IBNR and Case Development Liabilities	Cumulative Number of Reported Claims (in thousands)
2017	$ 14,095	$ 13,864	$ 13,888	$ 13,824	$ 13,777	$ 232	2,646
2018		15,383	15,226	14,985	14,838	495	2,713
2019			16,901	16,678	16,191	1,202	2,778
2020				14,637	14,024	2,564	2,087
2021					17,481	5,541	2,216
				Incurred losses and ALAE	$ 76,311		

Accident Year	Cumulative Paid Losses and ALAE through December 31, 2017*	2018*	2019*	2020*	2021
2017	$ 5,806	$ 9,944	$ 11,799	$ 12,729	$ 13,260
2018		6,218	10,772	12,658	13,757
2019			6,742	11,671	13,851
2020				5,395	9,839
2021					6,450
Paid losses and ALAE					57,157
Net unpaid losses and ALAE for 2017 – 2021 accident years					19,154
Net unpaid losses and ALAE for accident years before 2017					614
Net unpaid losses and ALAE					$ 19,768

* *Unaudited required supplemental information*

(16) Unpaid losses and loss adjustment expenses *(Continued)*

BH Primary

BH Primary's liabilities for unpaid losses and loss adjustment expenses primarily derive from medical professional liability and workers' compensation and other casualty insurance, which includes commercial auto and general liability insurance. Net incurred and paid losses and ALAE are summarized by accident year in the following tables, disaggregated by medical professional liability coverages and workers' compensation and other casualty coverages. IBNR and case development liabilities are as of December 31, 2021. The cumulative number of reported claims reflects the number of individual claimants and includes claims that ultimately resulted in no liability or payment. Dollars are in millions.

Medical Professional Liability

We estimate the ultimate expected incurred losses and loss adjustment expenses for medical professional claim liabilities using a variety of commonly accepted actuarial methodologies, such as the paid and incurred development method and Bornhuetter-Ferguson based methods, as well as other techniques that consider insured loss exposures and historical and expected loss trends, among other factors. These methodologies produce loss estimates from which we determine our best estimate. In addition, we study developments in older accident years and adjust initial loss estimates to reflect recent developments based upon claim age, coverage and litigation experience.

	Incurred Losses and ALAE through December 31,											
Accident Year	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019***	**2020***	**2021**	**IBNR and Case Development Liabilities**	**Cumulative Number of Reported Claims (in thousands)**
2012	$1,336	$1,306	$1,277	$1,223	$1,168	$1,078	$1,035	$ 998	$ 988	$ 971	$ 51	11
2013		1,328	1,296	1,261	1,195	1,127	1,086	1,019	985	978	62	11
2014			1,370	1,375	1,305	1,246	1,218	1,127	1,061	1,033	108	11
2015				1,374	1,342	1,269	1,290	1,218	1,157	1,093	136	12
2016					1,392	1,416	1,414	1,394	1,341	1,288	213	15
2017						1,466	1,499	1,495	1,474	1,382	328	21
2018							1,602	1,650	1,659	1,580	495	23
2019								1,670	1,691	1,663	869	20
2020									1,704	1,751	1,319	27
2021										1,852	1,672	15
									Incurred losses and ALAE	$13,591		

	Cumulative Paid Losses and ALAE through December 31,									
Accident Year	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019***	**2020***	**2021**
2012	$ 15	$ 93	$ 218	$ 377	$ 522	$ 642	$ 725	$ 789	$ 830	$ 848
2013		15	90	219	368	518	635	743	793	821
2014			21	106	238	396	540	671	752	788
2015				23	108	218	382	543	663	719
2016					22	115	274	461	620	712
2017						27	128	300	457	582
2018							35	166	367	543
2019								39	160	314
2020									34	148
2021										36
									Paid losses and ALAE	5,511
									Net unpaid losses and ALAE for 2012 – 2021 accident years	8,080
									Net unpaid losses and ALAE for accident years before 2012	426
									Net unpaid losses and ALAE	$ 8,506

* *Unaudited required supplemental information*

(16) Unpaid losses and loss adjustment expenses *(Continued)*

Workers' Compensation and Other Casualty

We periodically evaluate ultimate loss and loss adjustment expense estimates for the workers' compensation and other casualty claims using a combination of commonly accepted actuarial methodologies such as the Bornhuetter-Ferguson and chain-ladder approaches using paid and incurred loss data. Paid and incurred loss data is segregated and analyzed by state due to the different state regulatory frameworks that may impact certain factors, including the duration and amount of loss payments. We also separately study the various components of liabilities, such as employee lost wages, medical expenses and the costs of claims investigations and administration. We establish case liabilities for reported claims based upon the facts and circumstances of the claim. The excess of the ultimate projected losses, including the expected development of case estimates, and the case-basis liabilities is included in IBNR liabilities.

	Incurred Losses and ALAE through December 31,											
Accident Year	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019***	**2020***	**2021**	**IBNR and Expected Development Liabilities**	**Cumulative Number of Reported Claims (in thousands)**
2012	$ 873	$ 850	$ 837	$ 791	$ 780	$ 762	$ 750	$ 736	$ 718	$ 709	$ 39	53
2013		1,258	1,228	1,178	1,127	1,096	1,072	1,050	1,028	1,008	96	67
2014			1,743	1,638	1,614	1,548	1,482	1,497	1,477	1,460	163	90
2015				2,169	2,127	2,042	2,014	2,025	1,997	2,006	242	111
2016					2,511	2,422	2,359	2,325	2,365	2,370	396	115
2017						3,044	2,907	2,842	2,843	2,852	503	139
2018							3,544	3,412	3,480	3,536	908	160
2019								4,074	4,102	4,175	1,278	173
2020									4,421	4,278	2,089	141
2021										5,197	3,545	218
									Incurred losses and ALAE	$27,591		

	Cumulative Paid Losses and ALAE through December 31,									
Accident Year	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019***	**2020***	**2021**
2012	$ 116	$ 299	$ 414	$ 501	$ 560	$ 592	$ 611	$ 626	$ 634	$ 640
2013		177	422	609	725	793	835	858	874	884
2014			239	557	800	1,007	1,111	1,176	1,214	1,245
2015				289	700	1,017	1,289	1,488	1,570	1,648
2016					329	775	1,148	1,461	1,661	1,778
2017						441	1,003	1,434	1,771	1,956
2018							538	1,198	1,683	2,028
2019								682	1,478	2,022
2020									695	1,391
2021										833
									Paid losses and ALAE	14,425
									Net unpaid losses and ALAE for 2012 – 2021 accident years	13,166
									Net unpaid losses and ALAE for accident years before 2012	413
									Net unpaid losses and ALAE	$13,579

* *Unaudited required supplemental information*

BHRG

We use a variety of methodologies to establish BHRG's estimates for property and casualty claims liabilities. These methodologies include paid and incurred loss development techniques, incurred and paid loss Bornhuetter-Ferguson techniques and frequency and severity techniques, as well as ground-up techniques when appropriate.

Our claims liabilities are principally a function of reported losses from ceding companies, case development and IBNR liability estimates. Case loss estimates are reported under our contracts either individually or in bulk as provided under the terms of the contracts. We may independently evaluate case losses reported by the ceding company, and if deemed appropriate, we may establish case liabilities based on our estimates.

(16) Unpaid losses and loss adjustment expenses *(Continued)*

Estimated IBNR liabilities are affected by expected case loss emergence patterns and expected loss ratios, which are evaluated as groups of contracts with similar exposures or on a contract-by-contract basis. Estimated case and IBNR liabilities for major catastrophe events are generally based on a per-contract assessment of the ultimate cost associated with the individual loss event. Claim count data is not provided consistently by ceding companies under our contracts or is otherwise considered unreliable.

Net incurred and paid losses and ALAE of BHRG are disaggregated based on losses that are expected to have shorter claim-tails (property) and losses expected to have longer claim-tails (casualty). Under certain contracts, the coverage can apply to multiple lines of business written by the ceding company, whether property, casualty or combined, and the ceding company may not report loss data by such lines consistently, if at all. In those instances, we allocated losses to property and casualty coverages based on internal estimates. BHRG's disaggregated incurred and paid losses and ALAE are summarized by accident year. IBNR and case development liabilities are as of December 31, 2021. Dollars are in millions.

Property

	Incurred Losses and ALAE through December 31,										
Accident Year	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019***	**2020***	**2021**	**IBNR and Case Development Liabilities**
2012	$ 3,129	$ 2,822	$ 2,621	$ 2,382	$ 2,330	$ 2,327	$ 2,309	$ 2,294	$ 2,285	$ 2,305	$ 31
2013		3,198	3,035	2,690	2,600	2,579	2,520	2,469	2,455	2,453	29
2014			2,619	2,408	2,297	2,154	2,100	2,028	1,999	1,996	33
2015				3,256	3,103	2,546	2,950	2,948	2,971	2,975	154
2016					3,261	3,890	3,616	3,585	3,589	3,578	112
2017						5,253	4,953	4,806	4,698	4,631	141
2018							4,375	4,467	4,344	4,227	461
2019								4,065	4,234	3,992	541
2020									5,795	6,048	1,504
2021										6,669	3,405
									Incurred losses and ALAE	$38,874	

	Cumulative Paid Losses and ALAE through December 31,									
Accident Year	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019***	**2020***	**2021**
2012	$ 259	$ 1,218	$ 1,796	$ 1,934	$ 2,022	$ 2,097	$ 2,117	$ 2,162	$ 2,180	$ 2,201
2013		515	1,424	1,863	2,060	2,180	2,260	2,300	2,328	2,352
2014			465	1,234	1,555	1,693	1,758	1,808	1,838	1,860
2015				577	1,596	1,946	2,141	2,245	2,427	2,510
2016					705	1,794	2,186	2,647	2,899	3,083
2017						1,025	2,712	3,633	3,944	4,163
2018							907	2,310	2,831	3,061
2019								748	2,247	2,830
2020									956	2,882
2021										1,214
									Paid losses and ALAE	26,156
									Net unpaid losses and ALAE for 2012 – 2021 accident years	12,718
									Net unpaid losses and ALAE for accident years before 2012	401
									Net unpaid losses and ALAE	$13,119

* *Unaudited required supplemental information*

Notes to Consolidated Financial Statements *(Continued)*

(16) Unpaid losses and loss adjustment expenses *(Continued)*

Casualty

Incurred Losses and ALAE through December 31,

Accident Year	2012*	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020*	2021	IBNR and Case Development Liabilities
2012	$ 2,792	$ 2,974	$ 2,808	$ 2,871	$ 2,799	$ 2,686	$ 2,619	$ 2,562	$ 2,556	$ 2,557	$ 372
2013		2,132	2,268	2,298	2,141	2,086	2,032	1,937	1,865	1,837	331
2014			1,872	2,069	2,038	2,001	1,915	1,952	1,942	1,847	431
2015				1,877	2,082	2,109	2,008	1,882	1,844	1,817	395
2016					1,906	2,115	2,023	1,980	1,900	1,843	451
2017						2,193	2,685	2,563	2,470	2,383	582
2018							2,924	3,559	3,482	3,340	904
2019								3,429	3,901	3,780	1,521
2020									3,861	3,987	2,147
2021										3,744	2,584
									Incurred losses and ALAE	$27,135	

Cumulative Paid Losses and ALAE through December 31,

Accident Year	2012*	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020*	2021
2012	$ 308	$ 747	$ 1,139	$ 1,368	$ 1,525	$ 1,650	$ 1,750	$ 1,810	$ 1,868	$ 1,906
2013		290	519	805	933	1,037	1,139	1,199	1,256	1,290
2014			149	477	642	752	874	959	1,103	1,147
2015				196	489	713	833	924	1,014	1,088
2016					253	555	732	862	960	1,043
2017						230	564	819	1,269	1,376
2018							265	867	1,639	1,909
2019								353	896	1,176
2020									404	970
2021										307
									Paid losses and ALAE	12,212
									Net unpaid losses and ALAE for 2012 – 2021 accident years	14,923
									Net unpaid losses and ALAE for accident years before 2012	8,688
									Net unpaid losses and ALAE	$23,611

* *Unaudited required supplemental information*

Required supplemental unaudited average historical claims duration information based on the net losses and ALAE incurred and paid accident year data in the preceding tables follows. The percentages show the average portions of net losses and ALAE paid by each succeeding year, with year 1 representing the current accident year.

Average Annual Percentage Payout of Incurred Losses by Age, Net of Reinsurance

In Year	1	2	3	4	5	6	7	8	9	10
GEICO Physical Damage	97%	3%								
GEICO Auto Liability	41%	30%	13%	8%	4%					
BH Primary Medical Professional Liability	2%	8%	12%	14%	13%	11%	8%	5%	4%	2%
BH Primary Workers' Compensation and Other Casualty	16%	21%	16%	12%	8%	4%	3%	2%	1%	1%
BHRG Property	19%	36%	16%	8%	5%	4%	2%	1%	1%	1%
BHRG Casualty	11%	16%	13%	9%	6%	5%	5%	3%	2%	2%

(17) Retroactive reinsurance contracts

Retroactive reinsurance policies provide indemnification of losses and loss adjustment expenses of short-duration insurance contracts with respect to underlying loss events that occurred prior to the contract inception date. Claims payments may commence immediately after the contract date or, when applicable, after a contractual retention amount has been reached. Reconciliations of the changes in estimated liabilities for retroactive reinsurance unpaid losses and loss adjustment expenses ("claim liabilities") and related deferred charge reinsurance assumed assets for each of the three years ended December 31, 2021 follow (in millions).

	2021		2020		2019	
	Unpaid losses and loss adjustment expenses	Deferred charges - retroactive reinsurance	Unpaid losses and loss adjustment expenses	Deferred charges - retroactive reinsurance	Unpaid losses and loss adjustment expenses	Deferred charges - retroactive reinsurance
Balances at beginning of year	$ 40,966	$ (12,441)	$ 42,441	$ (13,747)	$ 41,834	$ (14,104)
Incurred losses and loss adjustment expenses:						
Current year contracts	153	(17)	—	—	1,138	(453)
Prior years' contracts	(974)	1,819	(399)	1,306	378	810
Total	(821)	1,802	(399)	1,306	1,516	357
Paid losses and loss adjustment expenses	(1,889)	—	(1,076)	—	(909)	—
Balances at December 31	$ 38,256	$ (10,639)	$ 40,966	$ (12,441)	$ 42,441	$ (13,747)
Incurred losses and loss adjustment expenses, net of deferred charges	$ 981		$ 907		$ 1,873	

In the preceding table, classifications of incurred losses and loss adjustment expenses are based on the inception dates of the contracts, which reflect when our exposures to losses began. We do not believe that analysis of losses incurred and paid by accident year of the underlying event is relevant or meaningful given that our exposure to losses incepts when the contract incepts. Further, we believe the classifications of reported claims and case development liabilities have little or no practical analytical value.

Currently, our largest retroactive reinsurance contract is between our subsidiary, National Indemnity Company, and certain subsidiaries of American International Group, Inc. (collectively, "AIG"). Our estimated unpaid claim liabilities with regard to the AIG contract were approximately $15.8 billion at December 31, 2021 and $17.7 billion at December 31, 2020. Claim payments under this contract commenced in 2021 and were $1.2 billion during 2021. Deferred charges related to the AIG contract were approximately $4.5 billion at December 31, 2021 and $5.4 billion at December 31, 2020.

Incurred losses and loss adjustment expenses related to contracts written in prior years were $845 million in 2021, $907 million in 2020 and $1,188 million in 2019, which included recurring amortization of deferred charges and the effect of changes in the timing and amount of expected future loss payments.

In establishing retroactive reinsurance claim liabilities, we analyze historical aggregate loss payment patterns and project losses into the future under various probability-weighted scenarios. We expect the claim-tail to be very long for many contracts, with some lasting several decades. We monitor claim payment activity and review ceding company reports and other information concerning the underlying losses. We reassess and revise the expected timing and amounts of ultimate losses periodically or when significant events are revealed through our monitoring and review processes.

Estimated claim liabilities for retroactive reinsurance included estimates for environmental, asbestos and other latent injury exposures of approximately $12.3 billion at December 31, 2021 and $12.5 billion at December 31, 2020. Retroactive reinsurance contracts are generally subject to aggregate policy limits and thus, our exposure to such claims under these contracts is likewise limited. We monitor evolving case law and its effect on environmental and other latent injury claims. Changing laws or government regulations, newly identified toxins, newly reported claims, new theories of liability, new contract interpretations and other factors could result in increases in these liabilities, which could be material to our results of operations. We are unable to reliably estimate the amount of additional net loss or the range of net loss that is reasonably possible.

(18) Notes payable and other borrowings

Notes payable and other borrowings are summarized below (in millions). The weighted average interest rates and maturity date ranges shown in the following tables are based on borrowings as of December 31, 2021.

	Weighted Average Interest Rate	December 31, 2021	December 31, 2020
Insurance and other:			
Berkshire Hathaway Inc. ("Berkshire"):			
U.S. Dollar denominated due 2022-2047	3.3%	$ 6,820	$ 8,308
Euro denominated due 2023-2041	1.0%	7,792	8,326
Japanese Yen denominated due 2023-2060	0.6%	6,797	6,031
Berkshire Hathaway Finance Corporation ("BHFC"):			
U.S. Dollar denominated due 2022-2051	3.6%	10,758	10,766
Great Britain Pound denominated due 2039-2059	2.5%	2,325	2,347
Other subsidiary borrowings due 2022-2045	4.0%	4,438	4,682
Short-term subsidiary borrowings	2.9%	342	1,062
		$ 39,272	$ 41,522

During 2021, Berkshire repaid €550 million and $1.5 billion of maturing senior notes and issued €600 million of 0.5% senior notes due in 2041 and ¥160 billion (approximately $1.5 billion) of senior notes with maturity dates ranging from 2026 to 2041 and a weighted average interest rate of 0.5%. In January 2022, Berkshire repaid $600 million of maturing debt and issued ¥128.5 billion (approximately $1.1 billion) of senior notes with maturity dates ranging from 2027 to 2052 and a weighted average interest rate of 0.5%.

Borrowings of BHFC, a wholly owned finance subsidiary of Berkshire, consist of senior unsecured notes used to fund manufactured housing loans originated or acquired and equipment held for lease of certain subsidiaries. BHFC borrowings are fully and unconditionally guaranteed by Berkshire. In 2021, BHFC repaid $750 million of maturing senior notes and issued $750 million of 2.5% senior notes due in 2051.

The carrying values of Berkshire and BHFC non-U.S. Dollar denominated senior notes (€6.9 billion, £1.75 billion and ¥785.5 billion par) reflect the applicable exchange rates as of the balance sheet dates. The effects of changes in foreign currency exchange rates during the period are recorded in earnings as a component of selling, general and administrative expenses. Changes in the exchange rates resulted in pre-tax gains of $1.3 billion in 2021, pre-tax losses of $1.0 billion in 2020 and pre-tax gains of $192 million in 2019.

Berkshire also guarantees debt of other subsidiaries, aggregating approximately $3.8 billion at December 31, 2021. Generally, Berkshire's guarantee of a subsidiary's debt obligation is an absolute, unconditional and irrevocable guarantee for the full and prompt payment when due of all payment obligations.

	Weighted Average Interest Rate	December 31, 2021	December 31, 2020
Railroad, utilities and energy:			
Berkshire Hathaway Energy Company ("BHE") and subsidiaries:			
BHE senior unsecured debt due 2023-2051	4.3%	$ 13,003	$ 13,447
Subsidiary and other debt due 2022-2064	4.1%	36,759	36,420
Short-term borrowings	1.4%	2,009	2,286
Burlington Northern Santa Fe ("BNSF") and subsidiaries due 2022-2097	4.5%	23,219	23,220
		$ 74,990	$ 75,373

BHE subsidiary debt represents amounts issued pursuant to separate financing agreements. Substantially all of the assets of certain BHE subsidiaries are, or may be, pledged or encumbered to support or otherwise secure debt. These borrowing arrangements generally contain various covenants, including covenants which pertain to leverage ratios, interest coverage ratios and/or debt service coverage ratios. During 2021, BHE and its subsidiaries issued term debt of approximately $2.2 billion with maturity dates ranging from 2028 to 2052 and a weighted average interest rate of 3.2% and repaid $2.5 billion of term debt.

(18) Notes payable and other borrowings *(Continued)*

BNSF's borrowings are primarily senior unsecured debentures. During 2021, BNSF issued $1.55 billion of term debt with maturity dates in 2051 and 2052 and a weighted average interest rate of 3.1% and repaid debt of $1.54 billion. As of December 31, 2021, BNSF, BHE and their subsidiaries were in compliance with all applicable debt covenants. Berkshire does not guarantee any debt, borrowings or lines of credit of BNSF, BHE or their subsidiaries.

Our subsidiaries had unused lines of credit and commercial paper capacity to support short-term borrowing programs and provide additional liquidity. Unused lines of credit were approximately $10.4 billion at December 31, 2021, which included approximately $8.7 billion related to BHE and its subsidiaries.

Debt principal repayments expected during each of the next five years are as follows (in millions). Amounts in 2022 include short-term borrowings.

	2022	2023	2024	2025	2026
Insurance and other	$ 1,933	$ 5,879	$ 2,154	$ 2,703	$ 3,422
Railroad, utilities and energy	4,206	4,832	3,991	3,792	2,033
	$ 6,139	$ 10,711	$ 6,145	$ 6,495	$ 5,455

(19) Income taxes

The liabilities for income taxes reflected in our Consolidated Balance Sheets are as follows (in millions).

	December 31, 2021	December 31, 2020
Currently payable (receivable)	$ (482)	$ (276)
Deferred	89,679	73,261
Other	1,046	1,113
	$ 90,243	$ 74,098

The tax effects of temporary differences that give rise to significant portions of deferred tax assets and deferred tax liabilities are shown below (in millions).

	December 31, 2021	December 31, 2020
Deferred tax liabilities:		
Investments – unrealized appreciation	$ 55,437	$ 40,181
Deferred charges reinsurance assumed	2,234	2,613
Property, plant and equipment and equipment held for lease	31,323	30,203
Goodwill and other intangible assets	6,748	6,753
Other	4,094	3,736
	99,836	83,486
Deferred tax assets:		
Unpaid losses and loss adjustment expenses	(1,091)	(1,135)
Unearned premiums	(990)	(900)
Accrued liabilities	(1,868)	(2,193)
Regulatory liabilities	(1,349)	(1,421)
Other	(4,859)	(4,576)
	(10,157)	(10,225)
Net deferred tax liability	$ 89,679	$ 73,261

We have not established deferred income taxes on accumulated undistributed earnings of certain foreign subsidiaries, which are expected to be reinvested indefinitely. Repatriation of all accumulated earnings of foreign subsidiaries would be impracticable to the extent that such earnings represent capital to support normal business operations. Generally, no U.S. federal income taxes will be imposed on future distributions of foreign earnings under current law. However, distributions to the U.S. or other foreign jurisdictions could be subject to withholding and other local taxes.

(19) Income taxes *(Continued)*

Income tax expense reflected in our Consolidated Statements of Earnings for each of the three years ending December 31, 2021 was as follows (in millions).

	2021	2020	2019
Federal	$ 20,345	$ 10,596	$ 19,069
State	(527)	1,086	625
Foreign	1,061	758	1,210
	$ 20,879	$ 12,440	$ 20,904
Current	$ 5,326	$ 5,052	$ 5,818
Deferred	15,553	7,388	15,086
	$ 20,879	$ 12,440	$ 20,904

Income tax expense is reconciled to hypothetical amounts computed at the U.S. federal statutory rate for each of the three years ending December 31, 2021 in the table below (in millions).

	2021	2020	2019
Earnings before income taxes	$ 111,686	$ 55,693	$ 102,696
Hypothetical income tax expense computed at the U.S. federal statutory rate	$ 23,454	$ 11,696	$ 21,566
Dividends received deduction and tax-exempt interest	(457)	(448)	(433)
State income taxes, less U.S. federal income tax benefit	(417)	858	494
U.S. income tax credits	(1,860)	(1,519)	(942)
Goodwill impairments	—	1,977	20
Other differences, net	159	(124)	199
	$ 20,879	$ 12,440	$ 20,904
Effective income tax rate	18.7%	22.3%	20.4%

We file income tax returns in the United States and in state, local and foreign jurisdictions. We have settled income tax liabilities with the U.S. federal taxing authority ("IRS") for tax years through 2011. The U.S. federal income tax returns from 2012 through 2019 remain open, and tax years 2014 through 2019 are under audit. We are also under audit or subject to audit with respect to income taxes in many state and foreign jurisdictions. It is reasonably possible that certain of these income tax examinations will be settled in 2022. We currently do not believe that the outcome of unresolved issues or claims will be material to our Consolidated Financial Statements.

At December 31, 2021 and 2020, net unrecognized tax benefits were $1,046 million and $1,113 million, respectively. Included in the balance at December 31, 2021, were $878 million of tax positions that, if recognized, would impact the effective tax rate. The remaining balance in net unrecognized tax benefits principally relates to tax positions where the ultimate recognition is highly certain but there is uncertainty about the timing of recognition. Because of the impact of deferred income tax accounting, these positions, when recognized, would not affect the annual effective income tax rate. Other differences, net included expense of $60 million in 2020 and $377 million in 2019 for uncertain tax positions related to investments by a subsidiary in certain tax equity investment funds that generated income tax benefits from 2015 through 2018. We concluded it was more likely than not those income tax benefits are not valid. We do not expect any material increases to the estimated amount of unrecognized tax benefits during 2022.

(20) Fair value measurements

Our financial assets and liabilities are summarized below as of December 31, 2021 and December 31, 2020, with fair values shown according to the fair value hierarchy (in millions). The carrying values of cash and cash equivalents, U.S. Treasury Bills, other receivables and accounts payable, accruals and other liabilities are considered to be reasonable estimates of their fair values.

	Carrying Value	Fair Value	Quoted Prices (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
December 31, 2021					
Investments in fixed maturity securities:					
U.S. Treasury, U.S. government corporations and agencies	$ 3,303	$ 3,303	$ 3,261	$ 42	$ —
Foreign governments	10,994	10,994	10,286	708	—
Corporate bonds	1,774	1,774	—	1,774	—
Other	363	363	—	363	—
Investments in equity securities	350,719	350,719	339,225	8	11,486
Investment in Kraft Heinz common stock	13,112	11,683	11,683	—	—
Loans and finance receivables	20,751	22,174	—	2,178	19,996
Derivative contract assets *(1)*	329	329	6	230	93
Derivative contract liabilities:					
Railroad, utilities and energy *(1)*	277	277	2	51	224
Equity index put options *(1)*	99	99	—	—	99
Notes payable and other borrowings:					
Insurance and other	39,272	42,339	—	42,292	47
Railroad, utilities and energy	74,990	87,065	—	87,065	—
December 31, 2020					
Investments in fixed maturity securities:					
U.S. Treasury, U.S. government corporations and agencies	$ 3,403	$ 3,403	$ 3,358	$ 45	$ —
Foreign governments	11,338	11,338	9,259	2,079	—
Corporate bonds	5,191	5,191	—	5,191	—
Other	478	478	—	478	—
Investments in equity securities	281,170	281,170	271,848	38	9,284
Investment in Kraft Heinz common stock	13,336	11,280	11,280	—	—
Loans and finance receivables	19,201	20,554	—	2,692	17,862
Derivative contract assets *(1)*	270	270	1	72	197
Derivative contract liabilities:					
Railroad, utilities and energy *(1)*	121	121	6	96	19
Equity index put options *(1)*	1,065	1,065	—	—	1,065
Notes payable and other borrowings:					
Insurance and other	41,522	46,676	—	46,665	11
Railroad, utilities and energy	75,373	92,593	—	92,593	—

(1) *Assets are included in other assets and liabilities are included in accounts payable, accruals and other liabilities.*

(20) Fair value measurements *(Continued)*

The fair values of substantially all of our financial instruments were measured using market or income approaches. The hierarchy for measuring fair value consists of Levels 1 through 3, which are described below.

Level 1 – Inputs represent unadjusted quoted prices for identical assets or liabilities exchanged in active markets.

Level 2 – Inputs include directly or indirectly observable inputs (other than Level 1 inputs) such as quoted prices for similar assets or liabilities exchanged in active or inactive markets; quoted prices for identical assets or liabilities exchanged in inactive markets; other inputs that may be considered in fair value determinations of the assets or liabilities, such as interest rates and yield curves, volatilities, prepayment speeds, loss severities, credit risks and default rates; and inputs that are derived principally from or corroborated by observable market data by correlation or other means. Pricing evaluations generally reflect discounted expected future cash flows, which incorporate yield curves for instruments with similar characteristics, such as credit ratings, estimated durations and yields for other instruments of the issuer or entities in the same industry sector.

Level 3 – Inputs include unobservable inputs used in the measurement of assets and liabilities. Management is required to use its own assumptions regarding unobservable inputs because there is little, if any, market activity in the assets or liabilities and it may be unable to corroborate the related observable inputs. Unobservable inputs require management to make certain projections and assumptions about the information that would be used by market participants in valuing assets or liabilities.

Reconciliations of assets and liabilities measured and carried at fair value on a recurring basis with the use of significant unobservable inputs (Level 3) for each of the three years ending December 31, 2021 follow (in millions).

	Balance at beginning of year	Gains (losses) included in earnings	Acquisitions, dispositions and settlements	Transfers out of Level 3	Balance at December 31,
Investments in equity securities:					
2021	$ 8,978	$ 1,902	$ 1,100	$ (500)	$ 11,480
2020	10,405	(1,426)	—	(1)	8,978
2019	1	404	10,000	—	10,405
Equity index put option contract liabilities:					
2021	$ (1,065)	$ 966	$ —	$ 99	$ —
2020	(968)	(159)	62	—	(1,065)
2019	(2,452)	1,484	—	—	(968)

We acquired investments in Occidental Cumulative Perpetual Preferred Stock ("Occidental Preferred") and Occidental common stock warrants in August 2019 at an aggregate cost of $10 billion. We currently consider the related fair value measurements to contain Level 3 inputs. See Note 4 for information regarding these investments.

Quantitative information as of December 31, 2021 for assets and liabilities measured and carried at fair value on a recurring basis with the use of significant unobservable inputs (Level 3) follows (in millions).

	Fair Value	Principal Valuation Techniques	Unobservable Inputs	Weighted Average
Investments in equity securities:				
Preferred stock	$ 10,864	Discounted cash flow	Expected duration	7 years
			Discount for transferability restrictions and subordination	372 bps
Common stock warrants	616	Warrant pricing model	Expected duration	7 years
			Volatility	37%

(20) Fair value measurements *(Continued)*

Investments in equity securities in the preceding table include our investments in certain preferred and common stock warrants that do not have readily determinable market values as defined under GAAP. These investments are subject to contractual restrictions on transferability and contain provisions that currently prevent us from economically hedging our investments. We applied discounted cash flow techniques in valuing the preferred stock and we made assumptions regarding the expected duration of the investment and the effects of subordination in liquidation. In valuing the common stock warrants, we used a warrant valuation model. While most of the inputs to the model are observable, we made assumptions regarding the expected duration and volatility of the warrants.

(21) Common stock

Changes in Berkshire's issued, treasury and outstanding common stock during the three years ending December 31, 2021 are shown in the table below. In addition to our common stock, 1,000,000 shares of preferred stock are authorized, but none are issued.

	Class A, $5 Par Value (1,650,000 shares authorized)			Class B, $0.0033 Par Value (3,225,000,000 shares authorized)		
	Issued	Treasury	Outstanding	Issued	Treasury	Outstanding
Balance December 31, 2018	742,213	(12,897)	729,316	1,373,558,983	(6,138,909)	1,367,420,074
Conversions of Class A common stock to Class B common stock and exercises of replacement stock options	(22,906)	—	(22,906)	34,624,869	—	34,624,869
Treasury stock acquired	—	(4,440)	(4,440)	—	(17,563,410)	(17,563,410)
Balance December 31, 2019	719,307	(17,337)	701,970	1,408,183,852	(23,702,319)	1,384,481,533
Conversions of Class A common stock to Class B common stock	(40,784)	—	(40,784)	61,176,000	—	61,176,000
Treasury stock acquired	—	(17,255)	(17,255)	—	(95,614,062)	(95,614,062)
Balance December 31, 2020	678,523	(34,592)	643,931	1,469,359,852	(119,316,381)	1,350,043,471
Conversions of Class A common stock to Class B common stock	(12,622)	—	(12,622)	18,933,000	—	18,933,000
Treasury stock acquired	—	(14,196)	(14,196)	—	(78,501,968)	(78,501,968)
Balance December 31, 2021	665,901	(48,788)	617,113	1,488,292,852	(197,818,349)	1,290,474,503

Each Class A common share is entitled to one vote per share. Class B common stock possesses dividend and distribution rights equal to one-fifteen-hundredth (1/1,500) of such rights of Class A common stock. Each Class B common share possesses voting rights equal to one-ten-thousandth (1/10,000) of the voting rights of a Class A share. Unless otherwise required under Delaware General Corporation Law, Class A and Class B common shares vote as a single class. Each share of Class A common stock is convertible, at the option of the holder, into 1,500 shares of Class B common stock. Class B common stock is not convertible into Class A common stock. On an equivalent Class A common stock basis, there were 1,477,429 shares outstanding as of December 31, 2021 and 1,543,960 shares outstanding as of December 31, 2020.

Since we have two classes of common stock, we provide earnings per share data on the Consolidated Statements of Earnings for average equivalent Class A shares outstanding and average equivalent Class B shares outstanding. Class B shares are economically equivalent to one-fifteen-hundredth (1/1,500) of a Class A share. Average equivalent Class A shares outstanding represents average Class A shares outstanding plus one-fifteen-hundredth (1/1,500) of the average Class B shares outstanding. Average equivalent Class B shares outstanding represents average Class B shares outstanding plus 1,500 times average Class A shares outstanding.

Berkshire's common stock repurchase program, as amended, permits Berkshire to repurchase shares any time that Warren Buffett, Berkshire's Chairman of the Board and Chief Executive Officer, and Charlie Munger, Vice Chairman of the Board, believe that the repurchase price is below Berkshire's intrinsic value, conservatively determined. The program continues to allow share repurchases in the open market or through privately negotiated transactions and does not specify a maximum number of shares to be repurchased. However, repurchases will not be made if they would reduce the total value of Berkshire's consolidated cash, cash equivalents and U.S. Treasury Bill holdings below $30 billion. The repurchase program does not obligate Berkshire to repurchase any specific dollar amount or number of Class A or Class B shares and there is no expiration date to the program.

(22) Revenues from contracts with customers

We recognize revenue when a good or service is transferred to a customer. A good or service is transferred when or as the customer obtains control of that good or service. Revenues are based on the consideration we expect to receive in connection with our promises to deliver goods and services to our customers. The following tables summarize customer contract revenues disaggregated by reportable segment and the source of the revenue for each of the three years ended December 31, 2021 (in millions). Other revenues, which are not considered to be revenues from contracts with customers under GAAP, are primarily insurance premiums earned, interest, dividend and other investment income and leasing revenues.

2021	Manufacturing	McLane	Service and retailing	BNSF	Berkshire Hathaway Energy	Insurance, Corporate and other	Total
Manufactured products:							
Industrial and commercial products	$22,184	$ —	$ 159	$ —	$ —	$ —	$ 22,343
Building products	19,604	—	—	—	—	—	19,604
Consumer products	18,540	—	—	—	—	—	18,540
Grocery and convenience store distribution	—	31,245	—	—	—	—	31,245
Food and beverage distribution	—	17,332	—	—	—	—	17,332
Auto sales	—	—	9,966	—	—	—	9,966
Other retail and wholesale distribution	2,997	—	15,898	—	—	—	18,895
Service	1,486	751	4,123	23,120	5,583	—	35,063
Electricity and natural gas	—	—	—	—	18,264	—	18,264
Total	64,811	49,328	30,146	23,120	23,847	—	191,252
Other revenues	3,766	122	4,601	57	1,096	75,200	84,842
	$68,577	$49,450	$34,747	$23,177	$24,943	$75,200	$276,094

2020	Manufacturing	McLane	Service and retailing	BNSF	Berkshire Hathaway Energy	Insurance, Corporate and other	Total
Manufactured products:							
Industrial and commercial products	$20,772	$ —	$ 192	$ —	$ —	$ —	$ 20,964
Building products	15,943	—	—	—	—	—	15,943
Consumer products	14,757	—	—	—	—	—	14,757
Grocery and convenience store distribution	—	30,795	—	—	—	—	30,795
Food and beverage distribution	—	15,368	—	—	—	—	15,368
Auto sales	—	—	8,258	—	—	—	8,258
Other retail and wholesale distribution	2,452	—	12,470	—	—	—	14,922
Service	1,456	584	3,332	20,693	4,595	—	30,660
Electricity and natural gas	—	—	—	—	15,066	—	15,066
Total	55,380	46,747	24,252	20,693	19,661	—	166,733
Other revenues	3,598	93	3,859	57	1,353	69,817	78,777
	$58,978	$46,840	$28,111	$20,750	$21,014	$69,817	$245,510

2019	Manufacturing	McLane	Service and retailing	BNSF	Berkshire Hathaway Energy	Insurance, Corporate and other	Total
Manufactured products:							
Industrial and commercial products	$25,311	$ —	$ 184	$ —	$ —	$ —	$ 25,495
Building products	15,620	—	—	—	—	—	15,620
Consumer products	14,120	—	—	—	—	—	14,120
Grocery and convenience store distribution	—	33,057	—	—	—	—	33,057
Food and beverage distribution	—	16,767	—	—	—	—	16,767
Auto sales	—	—	8,481	—	—	—	8,481
Other retail and wholesale distribution	2,299	—	12,213	—	—	—	14,512
Service	1,642	539	4,062	23,302	4,096	—	33,641
Electricity and natural gas	—	—	—	—	14,819	—	14,819
Total	58,992	50,363	24,940	23,302	18,915	—	176,512
Other revenues	3,632	95	4,459	55	1,181	68,682	78,104
	$62,624	$50,458	$29,399	$23,357	$20,096	$68,682	$254,616

(22) Revenues from contracts with customers *(Continued)*

A summary of the transaction price allocated to the significant unsatisfied remaining performance obligations relating to contracts with expected durations in excess of one year as of December 31, 2021 and the timing of when the performance obligations are expected to be satisfied follows (in millions).

	Less than 12 months	Greater than 12 months	Total
Electricity and natural gas	$ 2,607	$ 21,038	$ 23,645
Other sales and service contracts	1,411	2,236	3,647

(23) Pension plans

Certain of our subsidiaries sponsor defined benefit pension plans. Benefits under the plans are generally based on years of service and compensation or fixed benefit rates. Plan sponsors may make contributions to the plans to meet regulatory requirements and may also make discretionary contributions. The components of our net periodic pension expense for each of the three years ending December 31, 2021 follow (in millions).

	2021	2020	2019
Service cost	$ 257	$ 235	$ 224
Interest cost	410	510	618
Expected return on plan assets	(1,008)	(955)	(936)
Amortization of actuarial losses and other	203	171	26
Net periodic pension expense	$ (138)	$ (39)	$ (68)

The projected benefit obligation ("PBO") is the actuarial present value of benefits earned based upon service and compensation prior to the valuation date and, if applicable, includes assumptions regarding future compensation levels. Benefit obligations under qualified U.S. defined benefit pension plans are funded through assets held in trusts. Pension obligations under certain non-U.S. plans and non-qualified U.S. plans are unfunded and the aggregate PBOs of such plans were $1.4 billion and $1.6 billion as of December 31, 2021 and 2020, respectively. The cost of certain BHE pension plans are expected to be recoverable through the regulated rate making process.

The funded status at year end 2021 and 2020 and reconciliations of the changes in PBOs and plan assets related to BHE's pension plans and all other pension plans for each of the two years ending December 31, 2021 follow (in millions).

	2021			2020		
	BHE	Other	Total	BHE	Other	Total
Benefit obligations						
PBO beginning of year	$ 5,282	$ 15,147	$ 20,429	$ 4,898	$ 13,808	$ 18,706
Service cost	46	211	257	33	202	235
Interest cost	109	301	410	133	377	510
Benefits paid	(214)	(795)	(1,009)	(285)	(709)	(994)
Settlements	(185)	(22)	(207)	(63)	(12)	(75)
Actuarial (gains) losses and other	(258)	(830)	(1,088)	566	1,481	2,047
PBO end of year	$ 4,780	$ 14,012	$ 18,792	$ 5,282	$ 15,147	$ 20,429
Plan assets						
Plan assets beginning of year	$ 5,158	$ 12,780	$ 17,938	$ 4,808	$ 11,688	$ 16,496
Employer contributions	41	124	165	69	127	196
Benefits paid	(214)	(795)	(1,009)	(285)	(709)	(994)
Actual return on plan assets	382	1,401	1,783	554	1,820	2,374
Settlements	(185)	(22)	(207)	(63)	(12)	(75)
Other	(24)	(26)	(50)	75	(134)	(59)
Plan assets end of year	$ 5,158	$ 13,462	$ 18,620	$ 5,158	$ 12,780	$ 17,938
Funded status – net (asset) liability	$ (378)	$ 550	$ 172	$ 124	$ 2,367	$ 2,491

(23) Pension plans *(Continued)*

The funded status reflected in assets was $1,954 million and in liabilities was $2,126 million at December 31, 2021. The funded status included in assets was $1,351 million and in liabilities was $3,842 million at December 31, 2020.

The accumulated benefit obligation ("ABO") is the actuarial present value of benefits earned based on service and compensation prior to the valuation date. The ABO was $17.9 billion at December 31, 2021 and $19.4 billion at December 31, 2020. Information for plans with PBOs and ABOs in excess of plan assets as of December 31, 2021 and 2020 follows (in millions).

	2021	2020
PBOs	$ 9,643	$ 12,775
Plan assets	7,518	9,018
ABOs	9,111	10,875
Plan assets	7,429	7,820

Weighted average assumptions used in determining PBOs and net periodic pension expense follow.

	2021	2020	2019
Discount rate applicable to PBOs	2.7%	2.3%	3.1%
Expected long-term rate of return on plan assets	6.1	6.2	6.4
Rate of compensation increase	2.6	2.6	2.5
Discount rate applicable to net periodic pension expense	2.4	3.1	4.0

Pension benefit payments expected over the next ten years are as follows (in millions): in 2022 – $1,048; in 2023 – $1,006; in 2024 – $1,007; in 2025 – $1,013; in 2026 – $1,014; and in 2027 to 2031 – $4,948. Sponsoring subsidiaries expect to contribute $149 million to the plans in 2022.

Fair value measurements of plan assets as of December 31, 2021 and 2020 follow (in millions).

	Fair Value				Investment funds and partnerships at net asset value
	Total	Level 1	Level 2	Level 3	
December 31, 2021					
Cash and cash equivalents	$ 992	$ 901	$ 91	$ —	$ —
Equity securities	11,343	10,358	660	325	—
Fixed maturity securities	3,422	2,226	1,168	28	—
Investment funds and other	2,863	180	361	57	2,265
	$ 18,620	$ 13,665	$ 2,280	$ 410	$ 2,265
December 31, 2020					
Cash and cash equivalents	$ 383	$ 243	$ 140	$ —	$ —
Equity securities	11,383	10,123	851	409	—
Fixed maturity securities	3,173	2,214	926	33	—
Investment funds and other	2,999	198	398	56	2,347
	$ 17,938	$ 12,778	$ 2,315	$ 498	$ 2,347

See Note 20 for a discussion of the three levels of fair value measurements. Plan assets are generally invested with the long-term objective of producing earnings to adequately cover expected benefit obligations, while assuming a prudent level of risk. Allocations may change due to changing market conditions and investment opportunities. The expected rates of return on plan assets reflect subjective assessments of expected long-term investment returns. Generally, past investment returns are not given significant consideration when establishing assumptions for expected long-term rates of return on plan assets. Actual experience will differ from the assumed rates of return.

(23) Pension plans *(Continued)*

A reconciliation of the pre-tax accumulated other comprehensive income (loss) related to defined benefit pension plans for each of the two years ending December 31, 2021 follows (in millions).

	2021	2020
Balance beginning of year	$ (2,251)	$ (1,896)
Amount included in net periodic pension expense	170	141
Actuarial gains (losses) and other	1,596	(496)
Balance end of year	$ (485)	$ (2,251)

Several of our subsidiaries also sponsor defined contribution retirement plans, such as 401(k) or profit-sharing plans. Employee contributions are subject to regulatory limitations and the specific plan provisions. Several plans provide for employer matching contributions up to levels specified in the plans and provide for additional discretionary contributions as determined by management. Our defined contribution plan expense was approximately $1.0 billion in 2021, $1.4 billion in 2020 and $1.2 billion in 2019.

(24) Accumulated other comprehensive income

A summary of the net changes in after-tax accumulated other comprehensive income attributable to Berkshire Hathaway shareholders for each of the three years ending December 31, 2021 follows (in millions).

	Unrealized appreciation of fixed maturity securities, net	Foreign currency translation	Defined benefit pension plans	Other	Accumulated other comprehensive income
Balance December 31, 2018	$ 370	$ (4,603)	$ (816)	$ 34	$ (5,015)
Other comprehensive income	160	257	(644)	(48)	(275)
Reclassifications into net earnings	(49)	—	91	5	47
Balance December 31, 2019	481	(4,346)	(1,369)	(9)	(5,243)
Other comprehensive income	78	1,264	(385)	(52)	905
Reclassifications into net earnings	(23)	—	109	9	95
Balance December 31, 2020	536	(3,082)	(1,645)	(52)	(4,243)
Other comprehensive income	(123)	(1,021)	1,163	80	99
Reclassifications into net earnings	(44)	11	135	15	117
Balance December 31, 2021	$ 369	$ (4,092)	$ (347)	$ 43	$ (4,027)

(25) Business segment data

Our operating businesses include a large and diverse group of insurance, manufacturing, service and retailing businesses. We organize our reportable business segments in a manner that reflects how management views those business activities. Certain businesses are grouped together for segment reporting based upon similar products or product lines, marketing, selling and distribution characteristics, even though those business units are operated under separate local management.

The tabular information that follows shows data of reportable segments reconciled to amounts reflected in our Consolidated Financial Statements. Intersegment transactions are not eliminated from segment results when management considers those transactions in assessing the results of the respective segments. Furthermore, our management does not consider investment and derivative gains/losses, impairments or amortization of certain business acquisition accounting adjustments related to Berkshire's business acquisitions or certain other corporate income and expense items in assessing the financial performance of operating units. Collectively, these items are included in reconciliations of segment amounts to consolidated amounts.

Berkshire's operating segments are as follows.

Business Identity	Business Activity
Insurance:	
GEICO	Underwriting private passenger automobile insurance mainly by direct response methods
Berkshire Hathaway Primary Group	Underwriting multiple lines of property and casualty insurance policies for primarily commercial accounts
Berkshire Hathaway Reinsurance Group	Underwriting excess-of-loss, quota-share and facultative reinsurance worldwide
Railroad ("BNSF")	Operation of one of the largest railroad systems in North America through Burlington Northern Santa Fe LLC
Utilities and energy ("BHE")	Regulated electric and gas utility, including power generation and distribution activities and real estate brokerage activities through Berkshire Hathaway Energy Company and affiliates
Manufacturing	Manufacturers of numerous products including industrial, consumer and building products, including home building and related financial services
McLane Company ("McLane")	Wholesale distribution of groceries and non-food items
Service and retailing	Providers of numerous services including shared aircraft ownership programs, aviation pilot training, electronic components distribution, various retailing businesses, including automobile dealerships and trailer and furniture leasing

Notes to Consolidated Financial Statements *(Continued)*

(25) Business segment data *(Continued)*

A disaggregation of our consolidated data for each of the three most recent years is presented as follows (in millions).

	Revenues			Earnings before income taxes		
	2021	2020	2019	2021	2020	2019
Operating Businesses						
Insurance:						
Underwriting:						
GEICO	$ 37,706	$ 35,093	$ 35,572	$ 1,259	$ 3,428	$ 1,506
Berkshire Hathaway Primary Group	11,575	9,615	9,165	607	110	383
Berkshire Hathaway Reinsurance Group	20,197	18,693	16,341	(930)	(2,700)	(1,472)
Insurance underwriting	69,478	63,401	61,078	936	838	417
Investment income	5,662	5,960	6,615	5,649	5,949	6,600
Total insurance	75,140	69,361	67,693	6,585	6,787	7,017
BNSF	23,282	20,869	23,515	7,861	6,792	7,250
BHE	24,987	21,031	20,114	3,184	2,479	2,618
Manufacturing	68,730	59,079	62,730	9,841	8,010	9,522
McLane	49,450	46,840	50,458	230	251	288
Service and retailing	34,832	28,178	29,487	4,481	2,628	2,555
	276,421	245,358	253,997	32,182	26,947	29,250
Reconciliation to consolidated amount						
Investment and derivative gains (losses)	—	—	—	78,542	40,746	72,607
Interest expense, not allocated to segments	—	—	—	(455)	(483)	(416)
Equity method investments	—	—	—	995	726	1,176
Goodwill and intangible asset impairments	—	—	—	—	(10,671)	(96)
Corporate, eliminations and other	(327)	152	619	422	(1,572)	175
	$ 276,094	$ 245,510	$ 254,616	$ 111,686	$ 55,693	$ 102,696

	Interest expense			Income tax expense		
	2021	2020	2019	2021	2020	2019
Operating Businesses						
Insurance	$ —	$ —	$ —	$ 1,050	$ 1,089	$ 1,166
BNSF	1,032	1,037	1,070	1,871	1,631	1,769
BHE	2,054	1,941	1,835	(1,177)	(1,010)	(526)
Manufacturing	704	737	752	2,193	1,795	2,253
McLane	—	—	—	61	71	71
Service and retailing	38	61	86	1,086	669	603
	3,828	3,776	3,743	5,084	4,245	5,336
Reconciliation to consolidated amount						
Investment and derivative gains	—	—	—	16,025	8,855	15,159
Interest expense, not allocated to segments	455	483	416	(96)	(102)	(88)
Equity method investments	—	—	—	106	57	148
Corporate, eliminations and other	(111)	(176)	(198)	(240)	(615)	349
	$ 4,172	$ 4,083	$ 3,961	$ 20,879	$ 12,440	$ 20,904

(25) Business segment data *(Continued)*

	Capital expenditures			Depreciation of tangible assets		
	2021	2020	2019	2021	2020	2019
Operating Businesses						
Insurance	$ 62	$ 50	$ 108	$ 72	$ 74	$ 82
BNSF	2,910	3,063	3,608	2,406	2,423	2,350
BHE	6,611	6,765	7,364	3,584	3,376	2,947
Manufacturing	2,100	2,133	2,981	2,037	2,026	1,951
McLane	106	98	158	189	204	225
Service and retailing	1,487	903	1,760	1,177	1,216	1,192
	$ 13,276	$ 13,012	$ 15,979	$ 9,465	$ 9,319	$ 8,747

	Goodwill at year-end			Identifiable assets at year-end		
	2021	2020	2019	2021	2020	2019
Operating Businesses						
Insurance	$ 15,181	$ 15,224	$ 15,289	$482,813	$399,169	$364,550
BNSF	14,852	14,851	14,851	76,586	73,809	73,699
BHE	11,906	11,763	9,979	112,117	109,286	88,651
Manufacturing	25,463	25,512	34,800	107,231	104,318	104,437
McLane	232	232	734	6,841	6,771	6,872
Service and retailing	6,241	6,152	6,229	28,221	26,173	26,494
	$ 73,875	$ 73,734	$ 81,882	813,809	719,526	664,703
Reconciliation to consolidated amount						
Corporate and other				71,100	80,469	71,144
Goodwill				73,875	73,734	81,882
				$958,784	$873,729	$817,729

Property/casualty and life/health insurance premiums written and earned are summarized below (in millions).

	Property/Casualty			Life/Health		
	2021	2020	2019	2021	2020	2019
Premiums Written:						
Direct	$ 53,829	$ 47,838	$ 47,578	$ 649	$ 510	$ 839
Assumed	12,461	11,533	10,214	5,685	5,960	5,046
Ceded	(1,015)	(898)	(821)	(40)	(42)	(45)
	$ 65,275	$ 58,473	$ 56,971	$ 6,294	$ 6,428	$ 5,840
Premiums Earned:						
Direct	$ 52,139	$ 46,418	$ 46,540	$ 649	$ 510	$ 839
Assumed	12,072	11,449	9,643	5,713	5,973	4,952
Ceded	(1,054)	(907)	(851)	(41)	(42)	(45)
	$ 63,157	$ 56,960	$ 55,332	$ 6,321	$ 6,441	$ 5,746

(25) Business segment data *(Continued)*

Insurance premiums written by geographic region (based upon the domicile of the insured or reinsured) are summarized below (in millions).

	Property/Casualty			Life/Health		
	2021	2020	2019	2021	2020	2019
United States	$ 55,451	$ 50,250	$ 50,529	$ 2,161	$ 2,820	$ 2,553
Western Europe	4,613	3,751	2,535	1,298	1,120	908
Asia Pacific	3,822	3,410	3,114	2,030	1,652	1,582
All other	1,389	1,062	793	805	836	797
	$ 65,275	$ 58,473	$ 56,971	$ 6,294	$ 6,428	$ 5,840

Consolidated sales, service and leasing revenues were $151.0 billion in 2021, $132.3 billion in 2020 and $140.8 billion in 2019. Sales, service and leasing revenues attributable to the United States were 85% in 2021, 86% in 2020 and 85% in 2019 of such amounts. The remainder of sales, service and leasing revenues were primarily in Europe, Canada and the Asia Pacific region. Railroad, utilities and energy revenues were $48.1 billion in 2021, $41.8 billion in 2020 and $43.5 billion in 2019. In each of the three years, approximately 96% of such revenues were attributable to the United States. At December 31, 2021, approximately 89% of our consolidated net property, plant and equipment and equipment held for lease was located in the United States with the remainder primarily in Canada and the United Kingdom.

(26) Contingencies and Commitments

We are parties in a variety of legal actions that routinely arise out of the normal course of business, including legal actions seeking to establish liability directly through insurance contracts or indirectly through reinsurance contracts issued by Berkshire subsidiaries. Plaintiffs occasionally seek punitive or exemplary damages. We do not believe that such normal and routine litigation will have a material effect on our financial condition or results of operations. Berkshire and certain of its subsidiaries are also involved in other kinds of legal actions, some of which assert or may assert claims or seek to impose fines and penalties. We believe that any liability that may arise as a result of other pending legal actions will not have a material effect on our consolidated financial condition or results of operations.

Our subsidiaries regularly make commitments in the ordinary course of business for the future purchase of goods and services used in their businesses, which are not yet reflected in our Consolidated Financial Statements. The most significant of our long-term commitments relate to our railroad, utilities and energy businesses and our shared aircraft ownership and leasing business. As of December 31, 2021, estimated future payments under those arrangements were as follows: $8 billion in 2022, $4 billion in 2023, $3 billion in 2024, $2 billion in 2025, $2 billion in 2026 and $15 billion after 2026.

As indicated in Note 5, we have an agreement to acquire an additional 41.4% ownership interest in Pilot in 2023. At that time, Pilot will become a consolidated subsidiary. Additionally, we may be obligated to acquire certain noncontrolling interests in less-than-wholly-owned subsidiaries in the future, pursuant to the terms of agreements with the noncontrolling shareholders. The timing and the amount of any future payments that might be required to such noncontrolling shareholders are contingent on future actions of the noncontrolling owners and the value of the interest being acquired. If we had acquired the additional interest in Pilot and all outstanding noncontrolling interests as of December 31, 2021, we estimate the aggregate cost of these acquisitions would approximate $11 billion.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None

Item 9A. Controls and Procedures

At the end of the period covered by this Annual Report on Form 10-K, the Corporation carried out an evaluation, under the supervision and with the participation of the Corporation's management, including the Chairman (Chief Executive Officer) and the Senior Vice President (Chief Financial Officer), of the effectiveness of the design and operation of the Corporation's disclosure controls and procedures pursuant to Exchange Act Rule 13a-15. Based upon that evaluation, the Chairman (Chief Executive Officer) and the Senior Vice President (Chief Financial Officer) concluded that the Corporation's disclosure controls and procedures are effective in timely alerting them to material information relating to the Corporation (including its consolidated subsidiaries) required to be included in the Corporation's periodic SEC filings. The report called for by Item 308(a) of Regulation S-K is incorporated herein by reference to Management's Report on Internal Control Over Financial Reporting, included on page K-66 of this report. The attestation report called for by Item 308(b) of Regulation S-K is incorporated herein by reference to the Report of Independent Registered Public Accounting Firm, included on page K-67 of this report. There has been no change in the Corporation's internal control over financial reporting during the quarter ended December 31, 2021 that has materially affected, or is reasonably likely to materially affect, the Corporation's internal control over financial reporting.

Item 9B. Other Information

None

Part III

Except for the information set forth under the caption "Executive Officers of the Registrant" in Part I hereof, information required by this Part (Items 10, 11, 12, 13 and 14) is incorporated by reference from the Registrant's definitive proxy statement, filed pursuant to Regulation 14A, for the Annual Meeting of Shareholders of the Registrant to be held on April 30, 2022, which meeting will involve the election of directors.

Part IV

Item 15. Exhibits and Financial Statement Schedules

(a)1. *Financial Statements*

The following Consolidated Financial Statements, as well as the Report of Independent Registered Public Accounting Firm, are included in Part II Item 8 of this report:

2. *Financial Statement Schedule*

Other schedules are omitted because they are not required, information therein is not applicable, or is reflected in the Consolidated Financial Statements or notes thereto.

(b) *Exhibits*

See the "Exhibit Index" at page K-117.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of
Berkshire Hathaway Inc.
Omaha, Nebraska

Opinion on the Financial Statement Schedule

We have audited the consolidated financial statements of Berkshire Hathaway Inc. and subsidiaries (the "Company") as of December 31, 2021 and 2020, and for each of the three years in the period ended December 31, 2021, and the Company's internal control over financial reporting as of December 31, 2021, and have issued our report thereon dated February 26, 2022; such consolidated financial statements and report are included elsewhere in this Form 10-K. Our audits also included the financial statement schedule of the Company listed in the Index at Item 15. This financial statement schedule is the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statement schedule based on our audits. In our opinion, such financial statement schedule, when considered in relation to the financial statements taken as a whole, presents fairly, in all material respects, the information set forth therein.

/s/ Deloitte & Touche LLP
Omaha, Nebraska
February 26, 2022

BERKSHIRE HATHAWAY INC. (Parent Company)
Condensed Financial Information
(Dollars in millions)
Schedule I
Balance Sheets

	December 31, 2021	December 31, 2020
Assets:		
Cash and cash equivalents	$ 18,797	$ 12,329
Short-term investments in U.S. Treasury Bills	9,681	29,773
Investments in and advances to/from consolidated subsidiaries	486,862	411,826
Investment in The Kraft Heinz Company	13,112	13,336
Other assets	140	108
	$ 528,592	$ 467,372
Liabilities and Shareholders' Equity:		
Accounts payable, accrued interest and other liabilities	$ 237	$ 369
Income taxes, principally deferred	747	1,174
Notes payable and other borrowings	21,409	22,665
	22,393	24,208
Berkshire Hathaway shareholders' equity	506,199	443,164
	$ 528,592	$ 467,372

Statements of Earnings and Comprehensive Income

	Year ended December 31, 2021	2020	2019
Income items:			
From consolidated subsidiaries:			
Dividends and distributions	$ 13,462	$ 26,110	$ 15,603
Undistributed earnings	74,819	17,402	65,237
	88,281	43,512	80,840
Investment gains (losses)	35	(24)	(125)
Equity in net earnings of The Kraft Heinz Company	269	95	493
Other income	73	328	780
	88,658	43,911	81,988
Cost and expense items:			
General and administrative	136	194	122
Interest expense	444	489	591
Foreign exchange (gains) losses on non-U.S. Dollar denominated debt	(1,281)	970	(193)
Income tax expense (benefit)	(436)	(263)	51
	(1,137)	1,390	571
Net earnings attributable to Berkshire Hathaway shareholders	89,795	42,521	81,417
Other comprehensive income attributable to Berkshire Hathaway shareholders	216	1,000	(228)
Comprehensive income attributable to Berkshire Hathaway shareholders	$ 90,011	$ 43,521	$ 81,189

See Note to Condensed Financial Information

BERKSHIRE HATHAWAY INC. (Parent Company)
Condensed Financial Information
(Dollars in millions)
Schedule I (continued)
Statements of Cash Flows

	Year ended December 31,		
	2021	**2020**	**2019**
Cash flows from operating activities:			
Net earnings attributable to Berkshire Hathaway shareholders	$ 89,795	$ 42,521	$ 81,417
Adjustments to reconcile net earnings to cash flows from operating activities:			
Investment gains/losses	(35)	24	125
Undistributed earnings of consolidated subsidiaries	(74,819)	(17,402)	(65,237)
Non-cash dividends from subsidiaries	(2,126)	(8,296)	—
Income taxes payable	(389)	(72)	(56)
Other	(1,038)	1,100	(693)
Net cash flows from operating activities	11,388	17,875	15,556
Cash flows from investing activities:			
Investments in and advances to/from consolidated subsidiaries, net	(174)	(1,947)	60
Purchases of U.S. Treasury Bills	(34,988)	(54,715)	(40,107)
Sales and maturities of U.S. Treasury Bills	57,296	59,035	36,943
Other	—	11	737
Net cash flows from investing activities	22,134	2,384	(2,367)
Cash flows from financing activities:			
Proceeds from borrowings	2,174	2,923	3,967
Repayments of borrowings	(2,167)	(1,151)	(758)
Acquisition of treasury stock	(27,061)	(24,706)	(4,850)
Other	—	—	19
Net cash flows from financing activities	(27,054)	(22,934)	(1,622)
Increase (decrease) in cash and cash equivalents	6,468	(2,675)	11,567
Cash and cash equivalents at beginning of year	12,329	15,004	3,437
Cash and cash equivalents at end of year	$ 18,797	$ 12,329	$ 15,004
Other cash flow information:			
Income taxes paid	$ 3,403	$ 3,391	$ 3,531
Interest paid	377	359	364

Note to Condensed Financial Information

Berkshire currently owns 26.6% of the outstanding shares of The Kraft Heinz Company ("Kraft Heinz") common stock, which is accounted for pursuant to the equity method. See Note 5 to the accompanying Consolidated Financial Statements for additional information regarding this investment.

In 2021, the Parent Company repaid €550 million of maturing senior notes and $1.5 billion of maturing senior notes and issued €600 million of 0.5% senior notes due in 2041 and ¥160 billion (approximately $1.5 billion) of senior notes with maturity dates ranging from 2026 to 2041 with a weighted average interest rate of 0.5%. As of December 31, 2021, the Parent Company's non-U.S. Dollar denominated borrowings included €6.9 billion and ¥785.5 billion par value senior notes. The gains and losses from the periodic remeasurement of these non-U.S. Dollar denominated notes due to changes in foreign currency exchange rates are included in earnings. In January 2022, Berkshire repaid $600 million of maturing debt and issued ¥128.5 billion (approximately $1.1 billion) of senior notes with maturity dates ranging from 2027 to 2052 and a weighted average interest rate of 0.5%.

Parent Company debt maturities over the next five years are as follows: 2022—$600 million; 2023—$4,467 million; 2024—$2,080 million; 2025—$1,681 million and 2026—$3,378 million. The Parent Company guarantees certain debt of subsidiaries, which aggregated approximately $17.0 billion at December 31, 2021, which was primarily debt issued by Berkshire Hathaway Finance Corporation. Such guarantees are an absolute, unconditional and irrevocable guarantee for the full and prompt payment when due of all present and future payment obligations. The Parent Company has also provided guarantees in connection with certain retroactive reinsurance contracts issued by subsidiaries. The amounts of subsidiary payments under these contracts, if any, is contingent upon the outcome of future events.

EXHIBIT INDEX

Exhibit No.	
2(i)	Agreement and Plan of Merger dated as of June 19, 1998 between Berkshire and General Re Corporation. Incorporated by reference to Annex I to Registration Statement No. 333-61129 filed on Form S-4.
2(ii)	Agreement and Plan of Merger dated as of November 2, 2009 by and among Berkshire, R Acquisition Company, LLC and BNSF. Incorporated by reference to Annex A to Registration Statement No. 333-163343 on Form S-4.
2(iii)	Agreement and Plan of Merger dated August 8, 2015, by and among Berkshire, NW Merger Sub Inc. and Precision Castparts Corporation ("PCC") Incorporated by reference to Exhibit 2.1 to PCC's Current Report on Form 8-K filed on August 10, 2015 (SEC File No. 001-10348)
3(i)	Restated Certificate of Incorporation Incorporated by reference to Exhibit 3(i) to Form 10-K filed on March 2, 2015.
3(ii)	By-Laws Incorporated by reference to Exhibit 3(ii) to Form 8-K filed on May 4, 2016.
4.1	Indenture, dated as of December 22, 2003, between Berkshire Hathaway Finance Corporation, Berkshire Hathaway Inc. and The Bank of New York Mellon Trust Company, N.A. (as successor to J.P. Morgan Trust Company, National Association), as trustee. Incorporated by reference to Exhibit 4.1 on Form S-4 of Berkshire Hathaway Finance Corporation and Berkshire Hathaway Inc. filed on February 4, 2004. SEC File No. 333-112486
4.2	Indenture, dated as of February 1, 2010, among Berkshire Hathaway Inc., Berkshire Hathaway Finance Corporation and The Bank of New York Mellon Trust Company, N.A., as trustee. Incorporated by reference to Exhibit 4.1 to Berkshire's Registration Statement on Form S-3 filed on February 1, 2010. SEC File No. 333-164611
4.3	Indenture, dated as of January 26, 2016, by and among Berkshire Hathaway Inc., Berkshire Hathaway Finance Corporation and The Bank of New York Mellon Trust Company, N.A., as trustee. Incorporated by reference to Exhibit 4.1 to Berkshire's Registration Statement on Form S-3 filed on January 26, 2016. SEC File No. 333-209122
4.4	Indenture, dated as of December 1, 1995, between BNSF and The First National Bank of Chicago, as trustee. Incorporated by reference to Exhibit 4 on Form S-3 of BNSF filed on February 8, 1999.
4.5	Indenture, dated as of October 4, 2002, by and between MidAmerican Energy Holdings Company and The Bank of New York, Trustee. Incorporated by reference to Exhibit 4.1 to the Berkshire Hathaway Energy Company Registration Statement No. 333-101699 dated December 6, 2002.
4.6	Indenture, dated as of January 28, 2022, by and among Berkshire Hathaway Inc., as an issuer and a guarantor of the debt securities issued by Berkshire Hathaway Finance Corporation, Berkshire Hathaway Finance Corporation, as an issuer, and The Bank of New York Mellon Trust Company, N.A., as trustee. Incorporated by reference to Exhibit 4.1 to Berkshire's Registration Statement on Form S-3 filed on January 28, 2022. SEC File No 333-262384.
	Other instruments defining the rights of holders of long-term debt of Registrant and its subsidiaries are not being filed since the total amount of securities authorized by all other such instruments does not exceed 10% of the total assets of the Registrant and its subsidiaries on a consolidated basis as of December 31, 2021. The Registrant hereby agrees to furnish to the Commission upon request a copy of any such debt instrument to which it is a party.
10.1	Equity Commitment Letter of Berkshire Hathaway Inc. with Hawk Acquisition Holding Corporation dated February 13, 2013. Incorporated by reference to Exhibit 10.1 on Form 8-K of Berkshire Hathaway Inc. filed on February 14, 2013.
14	Code of Ethics Berkshire's Code of Business Conduct and Ethics is posted on its Internet website at *www.berkshirehathaway.com*
21	Subsidiaries of Registrant
23	Consent of Independent Registered Public Accounting Firm

Exhibit No.	
31.1	Rule 13a—14(a)/15d-14(a) Certification
31.2	Rule 13a—14(a)/15d-14(a) Certification
32.1	Section 1350 Certification
32.2	Section 1350 Certification
95	Mine Safety Disclosures
101	The following financial information from Berkshire Hathaway Inc.'s Annual Report on Form 10-K for the year ended December 31, 2021, formatted in iXBRL (Inline Extensible Business Reporting Language) includes: (i) the Cover Page (ii) the Consolidated Balance Sheets, (iii) the Consolidated Statements of Earnings, (iv) the Consolidated Statements of Comprehensive Income, (v) the Consolidated Statements of Changes in Shareholders' Equity, (vi) the Consolidated Statements of Cash Flows, and (vii) the Notes to Consolidated Financial Statements and Schedule I, tagged in summary and detail.
104	Cover Page Interactive Data File (formatted as iXBRL and contained in Exhibit 101)

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

BERKSHIRE HATHAWAY INC.

Date: February 26, 2022

/S/ MARC D. HAMBURG

Marc D. Hamburg
Senior Vice President and
Principal Financial Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

/s/ WARREN E. BUFFETT **Warren E. Buffett**	Chairman of the Board of Directors—Chief Executive Officer	February 26, 2022 Date
/s/ GREGORY E. ABEL **Gregory E. Abel**	Director—Vice Chairman—Non-Insurance Operations	February 26, 2022 Date
/s/ HOWARD G. BUFFETT **Howard G. Buffett**	Director	February 26, 2022 Date
/s/ SUSAN A. BUFFETT **Susan A. Buffett**	Director	February 26, 2022 Date
/s/ STEPHEN B. BURKE **Stephen B. Burke**	Director	February 26, 2022 Date
/s/ KENNETH I. CHENAULT **Kenneth I. Chenault**	Director	February 26, 2022 Date
/s/ CHRISTOPHER C. DAVIS **Christopher C. Davis**	Director	February 26, 2022 Date
/s/ SUSAN L. DECKER **Susan L. Decker**	Director	February 26, 2022 Date
/s/ DAVID S. GOTTESMAN **David S. Gottesman**	Director	February 26, 2022 Date
/s/ CHARLOTTE GUYMAN **Charlotte Guyman**	Director	February 26, 2022 Date
/s/ AJIT JAIN **Ajit Jain**	Director—Vice Chairman—Insurance Operations	February 26, 2022 Date
/s/ CHARLES T. MUNGER **Charles T. Munger**	Director—Vice Chairman	February 26, 2022 Date
/s/ RONALD L. OLSON **Ronald L. Olson**	Director	February 26, 2022 Date
/s/ MERYL B. WITMER **Meryl B. Witmer**	Director	February 26, 2022 Date
/s/ MARC D. HAMBURG **Marc D. Hamburg**	Senior Vice President—Principal Financial Officer	February 26, 2022 Date
/s/ DANIEL J. JAKSICH **Daniel J. Jaksich**	Vice President—Principal Accounting Officer	February 26, 2022 Date

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K

☑ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2020

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from ______ to ______

Commission file number 001-14905

BERKSHIRE HATHAWAY INC.
(Exact name of Registrant as specified in its charter)

Delaware	47-0813844
State or other jurisdiction of incorporation or organization	(I.R.S. Employer Identification No.)
3555 Farnam Street, Omaha, Nebraska	68131
(Address of principal executive office)	(Zip Code)

Registrant's telephone number, including area code (402) 346-1400

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbols	Name of each exchange on which registered
Class A Common Stock	BRK.A	New York Stock Exchange
Class B Common Stock	BRK.B	New York Stock Exchange
0.750% Senior Notes due 2023	BRK23	New York Stock Exchange
1.125% Senior Notes due 2027	BRK27	New York Stock Exchange
1.625% Senior Notes due 2035	BRK35	New York Stock Exchange
1.300% Senior Notes due 2024	BRK24	New York Stock Exchange
2.150% Senior Notes due 2028	BRK28	New York Stock Exchange
0.625% Senior Notes due 2023	BRK23A	New York Stock Exchange
0.000% Senior Notes due 2025	BRK25	New York Stock Exchange
2.375% Senior Notes due 2039	BRK39	New York Stock Exchange
0.500% Senior Notes due 2041	BRK41	New York Stock Exchange
2.625% Senior Notes due 2059	BRK59	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: NONE

Indicate by check mark if the Registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☑ No ☐

Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☑

Indicate by check mark whether the Registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☑ No ☐

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act. Large accelerated filer ☑ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐

If an emerging growth company, indicate by check mark if the Registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☑

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☑

State the aggregate market value of the voting stock held by non-affiliates of the Registrant as of June 30, 2020: $336,500,000,000*

Indicate the number of shares outstanding of each of the Registrant's classes of common stock:

February 16, 2021—Class A common stock, $5 par value	640,586 shares
February 16, 2021—Class B common stock, $0.0033 par value	1,336,348,609 shares

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Proxy Statement for the Registrant's Annual Meeting to be held May 1, 2021 are incorporated in Part III.

* This aggregate value is computed at the last sale price of the common stock as reported on the New York Stock Exchange on June 30, 2020. It does not include the value of Class A common stock and Class B common stock held by Directors and Executive Officers of the Registrant and members of their immediate families, some of whom may not constitute "affiliates" for purpose of the Securities Exchange Act of 1934.

Table of Contents

Part I

Item 1. Business Description

Berkshire Hathaway Inc. (“Berkshire,” “Company” or “Registrant”) is a holding company owning subsidiaries engaged in a large number of diverse business activities. The most important of these are insurance businesses conducted on both a primary basis and a reinsurance basis, a freight rail transportation business and a group of utility and energy generation and distribution businesses. Berkshire also owns and operates numerous other businesses engaged in a variety of activities, as identified herein. Berkshire is domiciled in the state of Delaware, and its corporate headquarters is in Omaha, Nebraska.

Berkshire’s operating businesses are managed on an unusually decentralized basis. There are few centralized or integrated business functions. Berkshire’s corporate senior management team participates in and is ultimately responsible for significant capital allocation decisions, investment activities and the selection of the Chief Executive to head each of the operating businesses.

Berkshire’s senior management is also responsible for establishing and monitoring Berkshire’s corporate governance practices, including monitoring governance efforts, including those at the operating businesses, and participating in the resolution of governance-related issues as needed. Berkshire’s Board of Directors is responsible for assuring an appropriate successor to the Chief Executive Officer. The Berkshire Code of Business Conduct and Ethics emphasizes, among other things, the commitment to ethics and compliance with the law and provides basic standards for ethical and legal behavior of its employees.

Berkshire and its consolidated subsidiaries employed approximately 360,000 people worldwide at the end of 2020. Human capital and resources are an integral and essential component of Berkshire’s businesses. Consistent with Berkshire’s decentralized management philosophy, Berkshire’s operating businesses establish specific policies and practices for their businesses concerning the attraction and retention of personnel within the organizations. Such policies and practices generally address, among other things: maintaining a safe work environment for employees, customers and other business partners, offering competitive compensation to employees, including health insurance and retirement benefits and incentives, providing learning and career development opportunities, and hiring practices intended to identify qualified candidates and promote diversity and inclusion in the workforce.

Insurance and Reinsurance Businesses

Berkshire’s insurance and reinsurance business activities are conducted through numerous domestic and foreign-based insurance entities. Berkshire’s insurance businesses provide insurance and reinsurance of property and casualty and life, accident and health risks worldwide. Berkshire’s insurance businesses employed approximately 51,000 people at the end of 2020.

In direct or primary insurance activities, the insurer assumes the risk of loss from persons or organizations that are directly subject to the risks. Such risks may relate to property, casualty (or liability), life, accident, health, financial or other perils that may arise from an insurable event. In reinsurance activities, the reinsurer assumes defined portions of risks that other direct insurers or reinsurers assumed in their own insuring activities.

Reinsurance contracts are normally classified as treaty or facultative contracts. Treaty reinsurance refers to reinsurance coverage for all or a portion of a specified group or class of risks ceded by the direct insurer, while facultative reinsurance involves coverage of specific individual underlying risks. Reinsurance contracts are further classified as quota-share or excess. Under quota-share (proportional or pro-rata) reinsurance, the reinsurer shares proportionally in the original premiums and losses of the direct insurer or reinsurer. Excess (or non-proportional) reinsurance provides for the indemnification of the direct insurer or reinsurer for all or a portion of the loss in excess of an agreed upon amount or “retention.” Both quota-share and excess reinsurance contracts may provide for aggregate limits of indemnification.

Insurance and reinsurance are generally subject to regulatory oversight throughout the world. Except for regulatory considerations, there are virtually no barriers to entry into the insurance and reinsurance industry. Competitors may be domestic or foreign, as well as licensed or unlicensed. The number of competitors within the industry is not known. Insurers and reinsurers compete on the basis of reliability, financial strength and stability, financial ratings, underwriting consistency, service, business ethics, price, performance, capacity, policy terms and coverage conditions.

Insurers based in the United States ("U.S.") are subject to regulation by their states of domicile and by those states in which they are licensed to write policies on an admitted basis. The primary focus of regulation is to assure that insurers are financially solvent and that policyholder interests are otherwise protected. States establish minimum capital levels for insurance companies and establish guidelines for permissible business and investment activities. States have the authority to suspend or revoke a company's authority to do business as conditions warrant. States regulate the payment of dividends by insurance companies to their shareholders and other transactions with affiliates. Dividends, capital distributions and other transactions of extraordinary amounts are subject to prior regulatory approval.

Insurers may market, sell and service insurance policies in the states where they are licensed. These insurers are referred to as admitted insurers. Admitted insurers are generally required to obtain regulatory approval of their policy forms and premium rates. Non-admitted insurance markets have developed to provide insurance that is otherwise unavailable through admitted insurers. Non-admitted insurance, often referred to as "excess and surplus" lines, is procured by either state-licensed surplus lines brokers who place risks with insurers not licensed in that state or by the insured party's direct procurement from non-admitted insurers. Non-admitted insurance is subject to considerably less regulation with respect to policy rates and forms. Reinsurers are normally not required to obtain regulatory approval of premium rates or reinsurance contracts.

The insurance regulators of every state participate in the National Association of Insurance Commissioners ("NAIC"). The NAIC adopts forms, instructions and accounting procedures for use by U.S. insurers and reinsurers in preparing and filing annual statutory financial statements. However, an insurer's state of domicile has ultimate authority over these matters. In addition to its activities relating to the annual statement, the NAIC develops or adopts statutory accounting principles, model laws, regulations and programs for use by its members. Such matters deal with regulatory oversight of solvency, risk management, compliance with financial regulation standards and risk-based capital reporting requirements.

U.S. states, through the NAIC, and international insurance regulators through the International Association of Insurance Supervisors ("IAIS") have been developing standards and best practices focused on establishing a common set of principles ("Insurance Core Principles") and framework ("ComFrame") for the regulation of large multi-national insurance groups. The standards address a variety of topics regarding supervision, coordination of regulators, insurance capital standards, risk management and governance. While the IAIS standards do not have legal effect, the states and the NAIC are implementing various regulatory tools and mandates that are responsive to certain IAIS standards. For example, the U.S. state regulators now require insurance groups to file an annual report, called an Own Risk Solvency Assessment or ORSA, with the group's lead regulator. U.S. state regulators formed supervisory colleges intended to promote communication and cooperation amongst the various domestic international insurance regulators. The Nebraska Department of Insurance acts as the lead group wide supervisor for our group of insurance companies and chairs the Berkshire supervisory college. The NAIC is also developing further tools, including a group capital calculation tool and various liquidity assessments, that could be imposed on insurance groups in the future.

Berkshire's insurance companies maintain capital strength at exceptionally high levels, which differentiates them from their competitors. Collectively, the combined statutory surplus of Berkshire's U.S.-based insurers was approximately $237 billion at December 31, 2020. Berkshire's major insurance subsidiaries are rated AA+ by Standard & Poor's and A++ (superior) by A.M. Best with respect to their financial condition and claims paying ability.

The Terrorism Risk Insurance Act of 2002 established within the Department of the Treasury a Terrorism Insurance Program ("Program") for commercial property and casualty insurers by providing federal reinsurance of insured terrorism losses. The Program currently extends to December 31, 2027 through other Acts, most recently the Terrorism Risk Insurance Program Reauthorization Act of 2019 (the "2019 TRIA Reauthorization"). Hereinafter these Acts are collectively referred to as TRIA. Under TRIA, the Department of the Treasury is charged with certifying "acts of terrorism." Coverage under TRIA occurs if the industry insured loss for certified events occurring during the calendar year exceeds $200 million in 2020, or any calendar year thereafter.

To be eligible for federal reinsurance, insurers must make available insurance coverage for acts of terrorism, by providing policyholders with clear and conspicuous notice of the amount of premium that will be charged for this coverage and of the federal share of any insured losses resulting from any act of terrorism. Assumed reinsurance is specifically excluded from TRIA participation. TRIA currently also excludes certain forms of direct insurance (such as personal and commercial auto, burglary, theft, surety and certain professional liability lines). Reinsurers are not required to offer terrorism coverage and are not eligible for federal reinsurance of terrorism losses.

During 2020 and thereafter, in the event of a certified act of terrorism, the federal government will reimburse insurers (conditioned on their satisfaction of policyholder notification requirements) for 80% of their insured losses in excess of an insurance group's deductible. Under the Program, the deductible is 20% of the aggregate direct subject earned premium for relevant commercial lines of business in the immediately preceding calendar year. The aggregate deductible in 2021 for Berkshire's insurance group is expected to approximate $1.4 billion. There is also an aggregate program limit of $100 billion on the amount of the federal government coverage for each TRIA year.

The extent of insurance regulation varies significantly among the countries in which our non-U.S. operations conduct business. While each country imposes licensing, solvency, auditing, and financial reporting requirements, the type and extent of the requirements differ substantially. For example:

- in some countries, insurers are required to prepare and file monthly and/or quarterly financial reports, and in others, only annual reports;
- some regulators require intermediaries to be involved in the sale of insurance products, whereas other regulators permit direct sales contact between the insurer and the customer;
- the extent of restrictions imposed upon an insurer's use of local and offshore reinsurance vary;
- policy form filing and rate regulation vary by country;
- the frequency of contact and periodic on-site examinations by insurance authorities differ by country;
- the scope and prescriptive requirements of an insurer's risk management and governance framework vary significantly by country; and
- regulatory requirements relating to insurer dividend policies vary by country.

Significant variations can also be found in the size, structure, and resources of the local regulatory departments that oversee insurance activities. Certain regulators prefer close relationships with all subject insurers and others operate a risk-based approach.

Berkshire's insurance group operates in some countries through subsidiaries and in some countries through branches of subsidiaries. Berkshire insurance subsidiaries are located in several countries, including Germany, the United Kingdom ("UK"), Ireland, Australia and South Africa, and also maintain branches in other countries, including Canada, various members of the European Union ("EU"), Australia, New Zealand, Singapore, Hong Kong, Macau and Dubai. Most of these foreign jurisdictions impose local capital requirements. Other legal requirements include discretionary licensing procedures, local retention of funds and records, and data privacy and protection program requirements. Berkshire's international insurance companies are also subject to multinational application of certain U.S. laws.

There are various regulatory bodies and initiatives that impact Berkshire in multiple international jurisdictions and the potential for significant effect on the Berkshire insurance group could be heightened as a result of recent industry and economic developments.

On June 23, 2016, the UK voted in a national referendum to withdraw from the EU ("Brexit"), which resulted in the UK's withdrawal from the EU on January 31, 2020. In anticipation of the UK leaving the EU, Berkshire Hathaway European Insurance DAC in Ireland was established to permit property and casualty insurance and reinsurance businesses to continue to operate in the EU following Brexit. Following the withdrawal of the UK from the EU as a result of Brexit, Berkshire expects to continue to maintain a substantial presence in London.

Berkshire's insurance underwriting operations include the following groups: (1) GEICO, (2) Berkshire Hathaway Primary Group and (3) Berkshire Hathaway Reinsurance Group. Except for retroactive reinsurance and periodic payment annuity products that generate significant amounts of up-front premiums along with estimated claims expected to be paid over very long time periods (creating "float," see Investments section below), Berkshire expects to achieve a net underwriting profit over time and to reject inadequately priced risks. Underwriting profit is defined as earned premiums less associated incurred losses, loss adjustment expenses and underwriting and policy acquisition expenses. Underwriting profit does not include income earned from investments. Additional information related to each of Berkshire's underwriting groups follows.

GEICO—GEICO is headquartered in Chevy Chase, Maryland. GEICO's insurance subsidiaries consist of Government Employees Insurance Company, GEICO General Insurance Company, GEICO Indemnity Company, GEICO Casualty Company, GEICO Advantage Insurance Company, GEICO Choice Insurance Company, GEICO Secure Insurance Company, GEICO County Mutual Insurance Company and GEICO Marine Insurance Company. The GEICO companies primarily offer private passenger automobile insurance to individuals in all 50 states and the District of Columbia. GEICO also provides insurance for motorcycles, all-terrain vehicles, recreational vehicles, boats and small commercial fleets and acts as an agent for other insurers who offer homeowners, renters, life and identity management insurance to individuals who desire insurance coverages other than those offered by GEICO.

GEICO's marketing is primarily through direct response methods in which applications for insurance are submitted directly to the companies via the Internet or by telephone, and to a lesser extent, through captive agents. GEICO conducts business through regional service centers and claims adjustment and other facilities in 39 states.

The automobile insurance business is highly competitive in the areas of price and service. GEICO competes for private passenger automobile insurance customers in the preferred, standard and non-standard risk markets with other companies that sell directly to the customer as well as with companies that use agency sales forces, including State Farm, Allstate, Progressive and USAA. GEICO's advertising campaigns and competitive rates contributed to a cumulative increase in voluntary policies-in-force of approximately 36% over the past five years. According to the most recently published A.M. Best data for 2019, the five largest automobile insurers had a combined market share in 2019 of approximately 58% based on written premiums, with GEICO's market share being second largest at approximately 13.8%. Since that data was published, GEICO's management estimates its current market share may have declined, depending on how the effects of pandemic-related premium credit programs will be reflected in A.M. Best's measurements. Seasonal variations in GEICO's insurance business are not significant. However, extraordinary weather conditions or other factors may have a significant effect upon the frequency or severity of automobile claims.

State insurance departments stringently regulate private passenger auto insurance. As a result, it is difficult for insurance companies to differentiate their products. Competition for private passenger automobile insurance, which is substantial, tends to focus on price and level of customer service provided. GEICO's cost-efficient direct response marketing methods and emphasis on customer satisfaction enable it to offer competitive rates and value to its customers. GEICO primarily uses its own claims staff to manage and settle claims. The name and reputation of GEICO are material assets and management protects it and other service marks through appropriate registrations.

Berkshire Hathaway Primary Group—The Berkshire Hathaway Primary Group ("BH Primary") is a collection of independently managed insurers that provide a wide variety of insurance coverages to policyholders located principally in the United States. These various operations are discussed below.

NICO and certain affiliates ("NICO Primary") underwrite commercial motor vehicle and general liability insurance on an admitted basis and on an excess and surplus basis. Insurance coverages are offered nationwide primarily through insurance agents and brokers.

The Berkshire Hathaway Homestate Companies ("BHHC") is a group of insurers offering workers' compensation, commercial auto and commercial property coverages to a diverse client base. BHHC has a national reach, with the ability to provide first-dollar and small to large deductible workers' compensation coverage to employers in all states, except those where coverage is available only through state-operated workers' compensation funds. NICO Primary and BHHC are each based in Omaha, Nebraska.

Berkshire Hathaway Specialty Insurance ("BH Specialty") offers commercial property, casualty, healthcare professional liability, executive and professional, surety, travel, medical stop loss and homeowner's insurance through Berkshire Hathaway Specialty Insurance Company and other Berkshire insurance affiliates. BH Specialty writes primary and excess policies on an admitted and surplus basis in the U.S., and on a local or foreign non-admitted basis outside the U.S. BH Specialty is based in Boston, Massachusetts, with regional offices currently in several U.S. cities. BH Specialty also maintains international offices located in Australia, New Zealand, Canada and several countries in Asia, Europe and the Middle East. BH Specialty writes business through wholesale and retail insurance brokers, as well as managing general agents.

MedPro Group ("MedPro") is a leading provider of healthcare liability ("HCL") insurance in the United States. MedPro provides customized HCL insurance, claims, patient safety and risk solutions to physicians, surgeons, dentists and other healthcare professionals, as well as hospitals, senior care and other healthcare facilities. Additionally, MedPro provides HCL insurance solutions to the international markets through other Berkshire insurance affiliates, delivers liability insurance to other professionals, and offers specialized accident and health insurance solutions to colleges and other customers through its subsidiaries and other Berkshire affiliates. MedPro is based in Fort Wayne, Indiana.

U.S. Liability Insurance Company ("USLI") includes a group of five specialty insurers that underwrite commercial, professional and personal lines insurance on an admitted basis, as well as an excess and surplus basis. USLI markets policies in all 50 states and the District of Columbia and Canada through wholesale and retail insurance agents. USLI companies also underwrite and market a wide variety of specialty insurance products. USLI is based in Wayne, Pennsylvania.

The Berkshire Hathaway GUARD Insurance Companies ("GUARD") is a group of five insurance companies that provide workers' compensation, business owners', commercial auto, commercial package and homeowners' products to over 350,000 small and mid-sized businesses. GUARD also offers complementary professional liability and umbrella products nationwide. Policies are offered through independent agents and retail and wholesale brokers. GUARD is based in Wilkes-Barre, Pennsylvania. Central States Indemnity Company of Omaha, based in Omaha, Nebraska, primarily writes credit card credit insurance, Medicare Supplement insurance and agricultural equipment insurance.

On October 1, 2018, NICO acquired MLMIC Insurance Company ("MLMIC"). MLMIC has been the leading writer of medical professional liability insurance in New York State for over 40 years. MLMIC distributes its policies mostly on a

direct basis to medical and dental professionals, health care providers and hospitals. In October 2019, Berkshire sold its 81% interest in Applied Underwriters, Inc.

Berkshire Hathaway Reinsurance Group—Berkshire's combined global reinsurance business, referred to as the Berkshire Hathaway Reinsurance Group ("BHRG"), offers a wide range of coverages on property, casualty, life and health risks to insurers and reinsurers worldwide. Reinsurance business is written through National Indemnity Company ("NICO"), domiciled in Nebraska, its subsidiaries and various other insurance subsidiaries wholly owned by Berkshire (collectively, the "NICO Group") and General Re Corporation, domiciled in Delaware, and its subsidiaries (collectively the "General Re Group"). BHRG's underwriting operations in the U.S. are based in Stamford, Connecticut. BHRG also conducts business activities globally in 23 countries.

The type and volume of business written is dependent on market conditions, including prevailing premium rates and coverage terms. The level of underwriting activities often fluctuates significantly from year to year depending on the perceived level of price adequacy in specific insurance and reinsurance markets as well as from the timing of particularly large reinsurance transactions.

Property/casualty

The NICO Group offers traditional property/casualty reinsurance on both an excess-of-loss and a quota-share basis, catastrophe excess-of-loss treaty and facultative reinsurance, and primary insurance on an excess-of-loss basis for large or unusual risks for clients worldwide.

The type and volume of business written by the NICO Group may vary significantly from period to period resulting from changes in perceived premium rate adequacy and from unique or large transactions. A significant portion of NICO Group's annual reinsurance premium volume currently derives from a 20% quota-share agreement with Insurance Australia Group Limited ("IAG") that expires July 1, 2025. IAG is a multi-line insurer in Australia, New Zealand and other Asia-Pacific countries. The General Re Group conducts a global property and casualty reinsurance business. Reinsurance contracts are written on both a quota-share and excess basis for multiple lines of business. Contracts are primarily in the form of treaties, and to a lesser degree, on a facultative basis.

General Re Group conducts business in North America primarily through General Reinsurance Corporation ("GRC"), which is licensed in the District of Columbia and all states, except Hawaii, where it is an accredited reinsurer. GRC conducts operations in North America from its headquarters in Stamford, Connecticut and through 13 branch offices in the U.S. and Canada.

In North America, the General Re Group includes General Star National Insurance Company, General Star Indemnity Company and Genesis Insurance Company, which offer a broad array of specialty and surplus lines and property, casualty and professional liability coverages. Such business is marketed through a select group of wholesale brokers, managing general underwriters and program administrators, and offer solutions for the unique needs of public entity, commercial and captive customers.

General Re Group's international reinsurance business is conducted on a direct basis through General Reinsurance AG ("GRAG"), based in Cologne, Germany, and through several other subsidiaries and branches in 22 countries. International business is also written through brokers, including Faraday Underwriting Limited ("Faraday"), a wholly-owned subsidiary. Faraday owns the managing agent of Syndicate 435 at Lloyd's of London and provides capacity and participates in 100% of the results of Syndicate 435.

Life/health

The General Re Group also conducts a global life and health reinsurance business. In the U.S. and internationally, the General Re Group writes life, disability, supplemental health, critical illness and long-term care coverages. The life/health business is marketed on a direct basis. Approximately 35% of the aggregate life/health net premiums written by the General Re Group were in the Asia Pacific compared to 26% in the United States, 22% in Western Europe and 17% throughout the rest of the world.

Berkshire Hathaway Life Insurance Company of Nebraska ("BHLN"), a subsidiary of NICO, and its affiliates write reinsurance covering various forms of traditional life insurance exposures and, on a limited basis, health insurance exposures. BHLN and its affiliates have also periodically reinsured certain guaranteed minimum death, income, and similar benefit risks on closed-blocks of variable annuity reinsurance contracts.

Retroactive reinsurance

NICO also periodically writes retroactive reinsurance contracts. Retroactive reinsurance contracts indemnify ceding companies against the adverse development of claims arising from loss events that have already occurred under property and casualty policies issued in prior years. Coverages under such contracts are provided on an excess basis (above a stated retention) or for losses payable after the inception of the contract with no additional ceding company retention. Contracts are normally subject to aggregate limits of indemnification, which can be exceptionally large in amount. For instance, an excess contract written in January 2017 provides indemnification for 80% of up to $25 billion in excess of $25 billion retained by the ceding company. Significant amounts of asbestos, environmental and latent injury claims may arise under these contracts.

The concept of time-value-of-money is an important element in establishing retroactive reinsurance contract prices and terms since loss payments may occur over decades. Normally, expected ultimate losses payable under these policies are expected to exceed premiums, thus producing underwriting losses. Nevertheless, this business is written, in part, because of the large amounts of policyholder funds generated for investment, the economic benefit of which will be reflected through investment results in future periods.

Periodic payment annuity

BHLN writes periodic payment annuity insurance policies and reinsures existing annuity-like obligations. Under these policies, BHLN receives upfront premiums and agrees in the future to make periodic payments that often extend for decades. These policies, generally relate to the settlement of underlying personal injury or workers' compensation cases of other insurers, known as structured settlements. Consistent with retroactive reinsurance contracts, time-value-of-money concepts are an important factor in establishing annuity premiums and underwriting losses are expected from the periodic accretion of time-value discounted liabilities.

Investments of insurance businesses—Berkshire's insurance subsidiaries hold significant levels of invested assets. Investment portfolios are primarily managed by Berkshire's Chief Executive Officer. Investments include a very large portfolio of publicly traded equity securities, which are concentrated in relatively few issuers, as well as fixed maturity securities and cash and short-term investments. Generally, there are no targeted allocations by investment type or attempts to match investment asset and insurance liability durations. However, investment portfolios have historically included a much greater proportion of equity securities than is customary in the insurance industry.

Invested assets derive from shareholder capital as well as funds provided from policyholders through insurance and reinsurance business ("float"). Float is the approximate amount of net policyholder funds generated through underwriting activities that is available for investment. The major components of float are unpaid losses and loss adjustment expenses, life, annuity and health benefit liabilities, unearned premiums and other policyholder liabilities less premium and reinsurance receivables, deferred policy acquisition costs and deferred charges on reinsurance contracts. On a consolidated basis, float has grown from approximately $88 billion at the end of 2015 to approximately $138 billion at the end of 2020. The cost of float can be measured as the net pre-tax underwriting loss as a percentage of average float. In four of the past five years, Berkshire's cost of float was negative, as its insurance businesses produced net underwriting gains.

Railroad Business—Burlington Northern Santa Fe

Burlington Northern Santa Fe, LLC ("BNSF") is based in Fort Worth, Texas, and through BNSF Railway Company ("BNSF Railway") operates one of the largest railroad systems in North America. BNSF Railway had approximately 35,000 employees at the end of 2020. BNSF also operates a relatively smaller third-party logistics services business.

In serving the Midwest, Pacific Northwest, Western, Southwestern and Southeastern regions and ports of the United States, BNSF transports a range of products and commodities derived from manufacturing, agricultural and natural resource industries. Freight revenues are covered by contractual agreements of varying durations or common carrier published prices or company quotations. BNSF's financial performance is influenced by, among other things, general and industry economic conditions at the international, national and regional levels.

BNSF's primary routes, including trackage rights, allow it to access major cities and ports in the western and southern United States as well as parts of Canada and Mexico. In addition to major cities and ports, BNSF Railway efficiently serves many smaller markets by working closely with approximately 200 shortline railroads. BNSF Railway has also entered into marketing agreements with other rail carriers, expanding the marketing reach for each railroad and their customers. For the year ending December 31, 2020, approximately 37% of freight revenues were derived from consumer products, 26% from industrial products, 24% from agricultural products and 13% from coal.

Regulatory Matters

BNSF is subject to federal, state and local laws and regulations generally applicable to its businesses. Rail operations are subject to the regulatory jurisdiction of the Surface Transportation Board ("STB"), the Federal Railroad Administration of the United States Department of Transportation ("DOT"), the Occupational Safety and Health Administration ("OSHA"), as well as other federal and state regulatory agencies and Canadian regulatory agencies for operations in Canada. The STB has jurisdiction over disputes and complaints involving certain rates, routes and services, the sale or abandonment of rail lines, applications for line extensions and construction, and the merger with or acquisition of control of rail common carriers. The outcome of STB proceedings can affect the profitability of BNSF Railway's business.

The DOT and OSHA have jurisdiction under several federal statutes over a number of safety and health aspects of rail operations, including the transportation of hazardous materials. BNSF Railway is required to transport these materials to the extent of its common carrier obligation. State agencies regulate some aspects of rail operations with respect to health and safety in areas not otherwise preempted by federal law.

Environmental Matters

BNSF's rail operations, as well as those of its competitors, are also subject to extensive federal, state and local environmental regulation covering discharges to the ground or waters, air emissions, toxic substances and the generation, handling, storage, transportation and disposal of waste and hazardous materials. Such regulations effectively increase the costs and liabilities associated with rail operations. Environmental risks are also inherent in rail operations, which frequently involve transporting chemicals and other hazardous materials.

Many of BNSF's land holdings are or have been used for industrial or transportation-related purposes or leased to commercial or industrial companies whose activities may have resulted in discharges onto the property. Under federal (in particular, the Comprehensive Environmental Response, Compensation and Liability Act) and state statutes, BNSF may be held jointly and severally liable for cleanup and enforcement costs associated with a particular site without regard to fault or the legality of the original conduct. BNSF may also be subject to claims by third parties for investigation, cleanup, restoration or other environmental costs under environmental statutes or common law with respect to properties they own that have been impacted by BNSF operations.

Competition

The business environment in which BNSF operates is highly competitive. Depending on the specific market, deregulated motor carriers and other railroads, as well as river barges, ships and pipelines, may exert pressure on price and service levels. The presence of advanced, high service truck lines with expedited delivery, subsidized infrastructure and minimal empty mileage continues to affect the market for non-bulk, time-sensitive freight. The potential expansion of longer combination vehicles could further encroach upon markets traditionally served by railroads. In order to remain competitive, BNSF Railway and other railroads seek to develop and implement operating efficiencies to improve productivity.

As railroads streamline, rationalize and otherwise enhance their franchises, competition among rail carriers intensifies. BNSF Railway's primary rail competitor in the Western region of the United States is the Union Pacific Railroad Company. Other Class I railroads and numerous regional railroads and motor carriers also operate in parts of the same territories served by BNSF Railway.

Utilities and Energy Businesses—Berkshire Hathaway Energy

Berkshire currently owns 91.1% of the outstanding common stock of Berkshire Hathaway Energy Company ("BHE"). BHE is a global energy company with subsidiaries that generate, transmit, store, distribute and supply energy. BHE's locally managed businesses are organized as separate operating units. BHE's domestic regulated energy interests are comprised of four regulated utility companies serving approximately 5.2 million retail customers, five interstate natural gas pipeline companies with approximately 21,300 miles of operated pipeline having a design capacity of approximately 21 billion cubic feet of natural gas per day and ownership interests in electricity transmission businesses. BHE's Great Britain electricity distribution subsidiaries serve about 3.9 million electricity end-users and its electricity transmission-only business in Alberta, Canada serves approximately 85% of Alberta's population. BHE's interests also include a diversified portfolio of independent power projects, a liquefied natural gas export, import and storage facility, the largest residential real estate brokerage firm in the United States, and one of the largest residential real estate brokerage franchise networks in the United States. BHE employs approximately 24,000 people in connection with its various operations.

General Matters

PacifiCorp is a regulated electric utility company headquartered in Oregon, serving electric customers in portions of Utah, Oregon, Wyoming, Washington, Idaho and California. The combined service territory's diverse regional economy ranges from rural, agricultural and mining areas to urban, manufacturing and government service centers. No single segment of the economy dominates the combined service territory, which helps mitigate PacifiCorp's exposure to economic fluctuations. In addition to retail sales, PacifiCorp sells electricity on a wholesale basis.

MidAmerican Energy Company ("MEC") is a regulated electric and natural gas utility company headquartered in Iowa, serving electric and natural gas customers primarily in Iowa and also in portions of Illinois, South Dakota and Nebraska. MEC has a diverse retail customer base consisting of urban and rural residential customers and a variety of commercial and industrial customers. In addition to retail sales and natural gas transportation, MEC sells electricity principally to markets operated by regional transmission organizations and natural gas on a wholesale basis.

NV Energy, Inc. ("NV Energy") is an energy holding company headquartered in Nevada, primarily consisting of two regulated utility subsidiaries, Nevada Power Company ("Nevada Power") and Sierra Pacific Power Company ("Sierra Pacific") (collectively, the "Nevada Utilities"). Nevada Power serves retail electric customers in southern Nevada and Sierra Pacific serves retail electric and natural gas customers in northern Nevada. The Nevada Utilities' combined service territory's economy includes gaming, mining, recreation, warehousing, manufacturing and governmental services. In addition to retail sales and natural gas transportation, the Nevada Utilities sell electricity and natural gas on a wholesale basis.

As vertically integrated utilities, BHE's domestic utilities own approximately 29,000 net megawatts of generation capacity in operation and under construction. The domestic utilities business is subject to seasonal variations principally related to the use of electricity for air conditioning and natural gas for heating. Typically, regulated electric revenues are higher in the summer months, while regulated natural gas revenues are higher in the winter months.

The Great Britain distribution companies consist of Northern Powergrid (Northeast) plc and Northern Powergrid (Yorkshire) plc, which own a substantial electricity distribution network that delivers electricity to end-users in northeast England in an area covering approximately 10,000 square miles. The distribution companies primarily charge supply companies regulated tariffs for the use of their distribution systems.

AltaLink L.P. ("AltaLink") is a regulated electric transmission-only utility company headquartered in Calgary, Alberta. AltaLink's high voltage transmission lines and related facilities transmit electricity from generating facilities to major load centers, cities and large industrial plants throughout its 87,000 square mile service territory.

The natural gas pipelines consist of BHE GT&S, LLC ("BHE GT&S"), Northern Natural Gas Company ("Northern Natural") and Kern River Gas Transmission Company ("Kern River"). BHE GT&S was acquired on November 1, 2020.

BHE GT&S, based in Virginia, operates three interstate natural gas pipeline systems that consist of approximately 5,400 miles of natural gas transmission, gathering and storage pipelines and operates seventeen underground natural gas storage fields in the eastern region of the United States. BHE GT&S's large underground natural gas storage assets and pipeline systems are part of an interconnected gas transmission network that provides transportation services to utilities and numerous other customers. BHE GT&S is also an industry leader in liquefied natural gas solutions through its investments in and ownership of several liquefied natural gas facilities located throughout the eastern region of the United States.

Northern Natural, based in Nebraska, operates the largest interstate natural gas pipeline system in the United States, as measured by pipeline miles, reaching from west Texas to Michigan's Upper Peninsula. Northern Natural's pipeline system consists of approximately 14,500 miles of natural gas pipelines. Northern Natural's extensive pipeline system, which is interconnected with many interstate and intrastate pipelines in the national grid system, has access to supplies from multiple major supply basins and provides transportation services to utilities and numerous other customers. Northern Natural also operates three underground natural gas storage facilities and two liquefied natural gas storage peaking units. Northern Natural's pipeline system experiences significant seasonal swings in demand and revenue, with the highest demand typically occurring during the months of November through March.

Kern River, based in Utah, operates an interstate natural gas pipeline system that consists of approximately 1,400 miles and extends from supply areas in the Rocky Mountains to consuming markets in Utah, Nevada and California. Kern River transports natural gas for electric and natural gas distribution utilities, major oil and natural gas companies or affiliates of such companies, electric generating companies, energy marketing and trading companies, and financial institutions.

BHE Renewables, based in Iowa, owns interests in independent power projects having approximately 4,700 net megawatts of generation capacity that are in service in California, Texas, Illinois, Nebraska, New York, Arizona, Minnesota, Kansas, Hawaii and the Philippines. These independent power projects sell power generated primarily from wind, solar, geothermal and hydro sources under long-term contracts. Additionally, BHE Renewables has invested over $6 billion in 32 wind projects sponsored by third parties, commonly referred to as tax equity investments.

Regulatory Matters

PacifiCorp, MEC and the Nevada Utilities are subject to comprehensive regulation by various federal, state and local agencies. The Federal Energy Regulatory Commission ("FERC") is an independent agency with broad authority to implement provisions of the Federal Power Act, the Natural Gas Act, the Energy Policy Act of 2005 and other federal statutes. The FERC regulates rates for wholesale sales of electricity; transmission of electricity, including pricing and regional planning for the expansion of transmission systems; electric system reliability; utility holding companies; accounting and records retention; securities issuances; construction and operation of hydroelectric facilities; and other matters. The FERC also has the enforcement authority to assess civil penalties of up to $1.3 million per day per violation of rules, regulations and orders issued under the Federal Power Act. MEC is also subject to regulation by the Nuclear Regulatory Commission pursuant to the Atomic Energy Act of 1954, as amended, with respect to its 25% ownership of the Quad Cities Nuclear Station.

With certain limited exceptions, BHE's domestic utilities have an exclusive right to serve retail customers within their service territories and, in turn, have an obligation to provide service to those customers. In some jurisdictions, certain classes of customers may choose to purchase all or a portion of their energy from alternative energy suppliers, and in some jurisdictions retail customers can generate all or a portion of their own energy. Historically, state regulatory commissions have established retail electric and natural gas rates on a cost-of-service basis, designed to allow a utility the opportunity to recover what each state regulatory commission deems to be the utility's reasonable costs of providing services, including a fair opportunity to earn a reasonable return on its investments based on its cost of debt and equity. The retail electric rates of PacifiCorp, MEC and the Nevada Utilities are generally based on the cost of providing traditional bundled services, including generation, transmission and distribution services; however, rates are available for transmission and distribution-only services.

Northern Powergrid (Northeast) and Northern Powergrid (Yorkshire) each charge fees for the use of their distribution systems that are controlled by a formula prescribed by the British electricity regulatory body, the Gas and Electricity Markets Authority. The current eight-year price control period runs from April 1, 2015 through March 31, 2023.

AltaLink is regulated by the Alberta Utilities Commission ("AUC"), pursuant to the Electric Utilities Act (Alberta), the Public Utilities Act (Alberta), the Alberta Utilities Commission Act (Alberta) and the Hydro and Electric Energy Act (Alberta). The AUC is an independent quasi-judicial agency, which regulates and oversees Alberta's electricity transmission sector with broad authority that may impact many of AltaLink's activities, including its tariffs, rates, construction, operations and financing. Under the Electric Utilities Act, AltaLink prepares and files applications with the AUC for approval of tariffs to be paid by the Alberta Electric System Operator ("AESO") for the use of its transmission facilities, and the terms and conditions governing the use of those facilities. The AESO is an independent system operator in Alberta, Canada that oversees Alberta's integrated electrical system ("AIES") and wholesale electricity market. The AESO is responsible for directing the safe, reliable and economic operation of the AIES, including long-term transmission system planning.

The natural gas pipelines are subject to regulation by various federal and state agencies. The natural gas pipeline and storage operations of BHE GT&S, Northern Natural and Kern River are regulated by the FERC pursuant to the Natural Gas Act and the Natural Gas Policy Act of 1978. Under this authority, the FERC regulates, among other items, (a) rates, charges, terms and conditions of service, (b) the construction and operation of interstate pipelines, storage and related facilities, including the extension, expansion or abandonment of such facilities and (c) the construction and operation of liquefied natural gas import/export facilities. Interstate natural gas pipeline companies are also subject to regulations administered by the Office of Pipeline Safety within the Pipeline and Hazardous Materials Safety Administration, an agency of the DOT. Federal pipeline safety regulations are issued pursuant to the Natural Gas Pipeline Safety Act of 1968, as amended, which establishes safety requirements in the design, construction, operation and maintenance of interstate natural gas pipeline facilities.

Environmental Matters

BHE and its energy businesses are subject to federal, state, local and foreign laws and regulations regarding climate change, renewable portfolio standards, air and water quality, emissions performance standards, coal combustion byproduct disposal, hazardous and solid waste disposal, protected species and other environmental matters that have the potential to impact current and future operations. In addition to imposing continuing compliance obligations, these laws and regulations, such as the Federal Clean Air Act, provide regulators with the authority to levy substantial penalties for noncompliance, including fines, injunctive relief and other sanctions.

The Federal Clean Air Act, as well as state laws and regulations impacting air emissions, provides a framework for protecting and improving the nation's air quality and controlling sources of air emissions. These laws and regulations continue to be promulgated and implemented and will impact the operation of BHE's generating facilities and require them to reduce emissions at those facilities to comply with the requirements.

Renewable portfolio standards have been established by certain state governments and generally require electricity providers to obtain a minimum percentage of their power from renewable energy resources by a certain date. Utah, Oregon, Washington, California, Iowa and Nevada have adopted renewable portfolio standards. In addition, the potential adoption of state or federal clean energy standards, which include low-carbon, non-carbon and renewable electricity generating resources, may also impact electricity generators and natural gas providers.

In December 2015, an international agreement was negotiated by 195 nations to create a universal framework for coordinated action on climate change in what is referred to as the Paris Agreement. The Paris Agreement reaffirms the goal of limiting global temperature increase well below 2 degrees Celsius, while urging efforts to limit the increase to 1.5 degrees Celsius; establishes commitments by all parties to make nationally determined contributions and pursue domestic measures aimed at achieving the commitments; commits all countries to submit emissions inventories and report regularly on their emissions and progress made in implementing and achieving their nationally determined commitments; and commits all countries to submit new commitments every five years, with the expectation that the commitments will get more aggressive. In the context of the Paris Agreement, the United States agreed to reduce greenhouse gas emissions 26% to 28% by 2025 from 2005 levels. The Paris Agreement formally entered into force November 4, 2016. The United States completed its withdrawal from the Paris Agreement on November 4, 2020. President Biden accepted the terms of the climate agreement on January 21, 2021, and the United States completed its reentry on February 19, 2021.

On October 10, 2017, the Environmental Protection Agency ("EPA") issued a proposal to repeal the Clean Power Plan, which was intended to achieve an overall reduction in carbon dioxide emissions from existing fossil-fueled electric generating units of 32% below 2005 levels. On June 19, 2019, the EPA repealed the Clean Power Plan and issued the Affordable Clean Energy rule, which fully replaced the Clean Power Plan. In the Affordable Clean Energy rule, the EPA determined that the best system of emissions reduction for existing coal fueled power plants is heat rate improvements and identified a set of candidate technologies and measures that could improve heat rates. Measures taken to meet the standards of performance must be achieved at the source itself.

The EPA's repeal and replacement of the Clean Power Plan is not expected to have a material impact on BHE and its energy subsidiaries. Increasingly, states are adopting legislation and regulations to reduce greenhouse gas emissions, and local governments and consumers are seeking increasing amounts of clean and renewable energy.

BHE and its energy subsidiaries continue to focus on delivering reliable, affordable, safe and clean energy to its customers and on actions to mitigate greenhouse gas emissions. For example, through December 31, 2020, BHE's cumulative investment in wind, solar, geothermal and biomass generation is approximately $34 billion.

Non-Energy Businesses

HomeServices of America, Inc. ("HomeServices") is the largest residential real estate brokerage firm in the United States. In addition to providing traditional residential real estate brokerage services, HomeServices offers other integrated real estate services, including mortgage originations and mortgage banking, title and closing services, property and casualty insurance, home warranties, relocation services and other home-related services. It operates under 46 brand names with over 43,000 real estate agents in nearly 900 brokerage offices in 30 states and the District of Columbia.

HomeServices' franchise network currently includes approximately 370 franchisees in over 1,600 brokerage offices throughout the United States and Europe with over 53,000 real estate agents under two brand names. In exchange for certain fees, HomeServices provides the right to use the Berkshire Hathaway HomeServices or Real Living brand names and other related service marks, as well as providing orientation programs, training and consultation services, advertising programs and other services.

HomeServices' principal sources of revenue are dependent on residential real estate sales, which are generally higher in the second and third quarters of each year. This business is highly competitive and subject to general real estate market conditions.

Manufacturing Businesses

Berkshire's numerous and diverse manufacturing subsidiaries are grouped into three categories: (1) industrial products, (2) building products and (3) consumer products. Berkshire's industrial products businesses manufacture specialty chemicals, metal cutting tools, components for aerospace and power generation applications, and a variety of other products primarily for industrial use. The building products group produces prefabricated and site-built residential homes, flooring products, insulation, roofing and engineered products, building and engineered components, paint and coatings and bricks and masonry products. The consumer products group manufactures recreational vehicles, alkaline batteries, various apparel products, jewelry and custom picture framing products. Information concerning the major activities of these three groups follows. Berkshire's manufacturing businesses employed approximately 179,000 people at the end of 2020.

Industrial products

Precision Castparts

Precision Castparts Corp. ("PCC") manufactures complex metal components and products, provides high-quality investment castings, forgings, fasteners/fastener systems and aerostructures for critical aerospace and power and energy applications. PCC also manufactures seamless pipe for coal-fired, industrial gas turbine ("IGT") and nuclear power plants; downhole casing and tubing, fittings and various mill forms in a variety of nickel and steel alloys for severe-service oil and gas environments; investment castings and forgings for general industrial, armament, medical and other applications; nickel and titanium alloys in all standard mill forms from large ingots and billets to plate, foil, sheet, strip, tubing, bar, rod, extruded shapes, rod-in-coil, wire and welding consumables, as well as cobalt alloys, for the aerospace, chemical processing, oil and gas, pollution control and other industries; revert management solutions; fasteners for automotive and general industrial markets; specialty alloys for the investment casting and forging industries; heat treating and destructive testing services for the investment cast products and forging industries; grinder pumps and affiliated components for low-pressure sewer systems; critical auxiliary equipment and gas monitoring systems for the power generation industry; and metalworking tools for the fastener market and other applications.

Investment casting technology involves a multi-step process that uses ceramic molds in the manufacture of metal components with more complex shapes, closer tolerances and finer surface finishes than parts manufactured using other methods. PCC uses this process to manufacture products for aircraft engines, IGT and other aeroderivative engines, airframes, medical implants, armament, unmanned aerial vehicles and other industrial applications. PCC also manufactures high temperature carbon and ceramic composite components, including ceramic matrix composites, for use in next-generation aerospace engines.

PCC uses forging processes to manufacture components for the aerospace and power generation markets, including seamless pipe for coal-fired, industrial gas turbine and nuclear power plants, and downhole casings and tubing pipe for severe service oil and gas markets. PCC manufactures high-performance, nickel-based alloys used to produce forged components for aerospace and non-aerospace applications in such markets as oil and gas, chemical processing and pollution control. These titanium products are used to manufacture components for the commercial and military aerospace, power generation, energy and other industrial end markets.

PCC is also a leading developer and manufacturer of highly engineered fasteners, fastener systems, aerostructures and precision components, primarily for critical aerospace applications. These products are produced for the aerospace and power and energy markets, as well as for construction, automotive, heavy truck, farm machinery, mining and construction equipment, shipbuilding, machine tools, medical equipment, appliance and recreation markets. PCC has several significant customers, including aerospace original equipment manufacturers (Boeing and Airbus) and aircraft engine manufacturer suppliers (General Electric, Rolls Royce and Pratt &Whitney).

The majority of PCC's sales are from customer orders or demand schedules pursuant to long-term agreements. Contractual terms may provide for termination by the customer, subject to payment for work performed. PCC typically does not experience significant order cancellations, although periodically it receives requests for delays in delivery schedules. In 2020, delay requests increased due to the COVID-19 pandemic.

The effects of the COVID-19 pandemic and the grounding of the Boeing 737 MAX produced significant adverse effects on the PCC aerospace business in 2020. The sudden and material reductions in air travel led to aircraft build rate reductions and customer destocking at extraordinary rates. Aircraft build rates have not yet begun to recover in any meaningful way. During 2020, PCC significantly reduced its worldwide workforce by about 40% since the end of 2019 to help align operations to reduced aircraft build rates. The restructuring actions taken began to improve margins in late 2020 from the low margins experienced earlier in the year and further margin improvements are expected going forward.

PCC is subject to substantial competition in all of its markets. Components and similar products may be produced by competitors, who use either the same types of manufacturing processes as PCC or other processes. Although PCC believes its manufacturing processes, technology and experience provide advantages to its customers, such as high quality, competitive prices and physical properties that often meet more stringent demands, alternative forms of manufacturing can be used to produce many of the same components and products. Despite intense competition, PCC is a leading supplier in most of its principal markets. Several factors, including long-standing customer relationships, technical expertise, state-of-the-art facilities and dedicated employees, aid PCC in maintaining competitive advantages.

Several raw materials used in PCC products, including certain metals such as nickel, titanium, cobalt, tantalum and molybdenum, are found in only a few parts of the world. These metals are required for the alloys used in manufactured products. The availability and costs of these metals may be influenced by private or governmental cartels, changes in world politics, labor relations between the metal producers and their workforces and inflation.

Lubrizol Corporation

The Lubrizol Corporation ("Lubrizol") is a specialty chemical and performance materials company that produces and supplies technologies for the global transportation, industrial and consumer markets. Lubrizol currently operates two businesses: (1) Lubrizol Additives, which includes engine lubricant additives, driveline lubricant additives and industrial specialties products; and (2) Lubrizol Advanced Materials, which includes Engineered Materials (engineered polymers and performance coatings) and Life Sciences (beauty and personal care, health and home care solutions).

Lubrizol Additives products are used in a broad range of applications including engine oils, transmission fluids, gear oils, specialty driveline lubricants, fuels, metalworking fluids, compressor lubricants and greases for transportation and industrial applications. Lubrizol Advanced Materials products are used in many different types of applications including over-the-counter pharmaceutical products, medical devices, performance coatings, personal care products, sporting goods and plumbing and fire sprinkler systems. Lubrizol is an industry leader in many of the markets in which it competes. Lubrizol's principal lubricant additives competitors are Infineum International Ltd., Chevron Oronite Company and Afton Chemical Corporation. Advanced Materials competes in many markets with a variety of competitors in each product line.

With its considerable patent portfolio, Lubrizol uses its technological leadership position in product development and applies its science capabilities and formulation and market expertise to improve the quality and value of its products. Lubrizol leverages its scientific and applications knowledge to meet and exceed customer performance and sustainability requirements. While Lubrizol typically has patents that expire each year, it invests resources to protect its intellectual property and to develop or acquire innovative products for the markets it serves. Lubrizol uses many specialty and commodity chemical raw materials in its manufacturing processes. Raw materials are primarily feedstocks derived from petroleum and petrochemicals and, generally, are obtainable from several sources. The materials that Lubrizol chooses to purchase from a single source typically are subject to long-term supply contracts to ensure supply reliability.

Lubrizol operates its business on a global basis through more than 100 offices, laboratories, production facilities and warehouses on six continents, the most significant of which are North America, Europe, Asia and South America. Lubrizol markets its products worldwide through a direct sales organization and sales agents and distributors. Lubrizol's customers principally consist of major global and regional oil companies and industrial and consumer products companies that are located throughout the world. Some of its largest customers also may be suppliers. During 2020, no single customer accounted for more than 10% of Lubrizol's consolidated revenues. In 2020, the global pandemic had an adverse effect on many of the markets that Lubrizol serves, including the transportation and industrial markets. This was offset in part by strong demand for Lubrizol's technology that is used in personal care applications, such as hand sanitizers.

Lubrizol continues to expend necessary capital to upgrade and optimize operations, ensure compliance with health, safety and environmental requirements, and increase global manufacturing capacity, while reducing the environmental footprint of its operations. Lubrizol also makes a significant investment in its human capital to ensure that it attracts, develops and retains a talented and diverse employee workforce.

Lubrizol is subject to foreign, federal, state and local laws to protect the environment, limit manufacturing waste and emissions, ensure product and employee safety and regulate trade. The company believes that its policies, practices and procedures are designed to limit the risks of non-compliance with laws and consequent financial liability. Nevertheless, the operation of manufacturing plants entails ongoing environmental and other risks, and significant costs or liabilities could be incurred in the future.

IMC International Metalworking Companies

IMC International Metalworking Companies ("IMC") is one of the world's three largest multinational manufacturers of consumable precision carbide metal cutting tools for applications in a broad range of industrial end markets. IMC's principal brand names include ISCAR®, TaeguTec®, Ingersoll®, Tungaloy®, Unitac®, UOP®, It.te.di®, Qutiltec®, Tool—Flo®, PCT® and IMCO®. IMC's primary manufacturing facilities are located in Israel, the United States, South Korea, Japan, Germany, Italy, Switzerland, India and China.

IMC has five primary product lines: milling tools, gripping tools, turning/thread tools, drilling tools and tooling. The main products are split within each product line between consumable cemented tungsten carbide inserts and steel tool holders. Inserts comprise the vast majority of sales and earnings. Metal cutting inserts are used by industrial manufacturers to cut metals and are consumed during their use in cutting applications. IMC manufactures hundreds of types of highly engineered inserts within each product line that are tailored to maximize productivity and meet the technical requirements of customers. IMC's staff of scientists and engineers continuously develop and innovate products that address end user needs and requirements.

IMC's global sales and marketing network operates in virtually every major manufacturing center around the world, staffed with highly skilled engineers and technical personnel. IMC's customer base is very diverse, with its primary customers being large, multinational businesses in the automotive, aerospace, engineering and machinery industries. IMC operates a regional central warehouse system with locations in Israel, the United States, Belgium, Korea, Japan, China and Brazil. Additional small quantities of products are maintained at local IMC offices to provide on-time customer support and inventory management.

IMC competes in the metal cutting tools segment of the global metalworking tools market. The segment includes hundreds of participants who range from small, private manufacturers of specialized products for niche applications and markets to larger, global multinational businesses (such as Sandvik and Kennametal, Inc.) with a wide assortment of products and extensive distribution networks. Other manufacturing companies such as Kyocera, Mitsubishi, Sumitomo, Ceratizit and Korloy also play a significant role in the cutting tool market.

Marmon Holdings

Marmon Holdings, Inc. ("Marmon") is a global industrial organization comprising 11 diverse business sectors and more than 100 autonomous manufacturing and service businesses. Marmon's manufacturing and service operations are conducted at approximately 400 manufacturing, distribution and service facilities located primarily in the United States, as well as 22 other countries worldwide. Marmon's business sectors are described as follows.

Foodservice Technologies manufactures beverage dispensing and cooling equipment, hot and cold food preparation and holding equipment and related products for restaurants, global brand owners and other foodservice providers. Operations are based in the U.S. with manufacturing in the U.S., Mexico, China, the U.K., Germany and Italy. Products are sold primarily throughout the U.S., Europe and Asia.

Water Technologies manufactures water treatment equipment for residential, commercial and industrial applications worldwide. Operations are based primarily in the U.S., Canada, China, Singapore, India and Mexico with business centers located in Belgium, France, Poland, Germany, the U.K., Italy, Switzerland and U.A.E.

Transportation Products serves the automotive, heavy-duty highway transportation, and aerospace industries with precision-molded plastic components; fastener thread solutions; metal tubing; auto aftermarket transmission and chassis products; platform and lowbed trailers; and truck and trailer components. Operations and business are conducted primarily in the U.S., Mexico, Canada, Europe and Asia.

Retail Solutions provides retail environment design services; in-store digital merchandising, dispensing and display fixtures; shopping, material handling and security carts. Operations and business are conducted in the U.S., U.K. and Czech Republic.

Metal Services provides specialty metal pipe, tubing and related value-added services to customers across a broad range of industries. Operations are based in the U.S., Canada and Mexico and business is conducted primarily in those countries.

Electrical produces electrical wire for use in residential and commercial buildings, and specialty wire and cable for use in energy, transit, aerospace, defense, communication and other industrial applications. Operations are based in the U.S., Canada, India and England. Business is conducted globally and primarily in the U.S., Canada, India, the U.K., U.A.E. and China.

Plumbing & Refrigeration supplies copper tubing and copper, brass, aluminum and stainless-steel fittings and components for the plumbing, HVAC and refrigeration markets; custom coils for the HVAC market; and aluminum and brass forgings for many commercial and industrial applications. Business and operations are conducted primarily in the U.S.

Industrial Products supplies construction fasteners; gloves and other protective wear; gear drives, gearboxes, fan drives and pump drives for various markets; wind machines for agricultural use; and wheels, axles, and gears for rail, mining and other applications. Operations are primarily based in the U.S., Canada and China and business is conducted in those countries.

Rail & Leasing manufactures, leases and maintains railcars; leases intermodal tank containers; manufactures mobile railcar movers; provides in-plant rail switching and loading services; performs track construction and maintenance; and manufactures steel tank heads and cylinders.

Union Tank Car Company ("UTLX") is the largest component of Rail & Leasing and is a leading designer, builder and full-service lessor of railroad tank cars and other specialized railcars. Together with its Canadian affiliate Procor, UTLX owns a fleet of approximately 124,000 railcars for lease to customers in chemical, petrochemical, energy and agricultural/food industries. UTLX manufactures tank cars in the U.S. and performs railcar maintenance services at more than 100 locations across North America.

UTLX has a diversified customer base, both geographically and across industries. UTLX, while subject to cyclicality and significant competition in most of its markets, competes by offering a broad range of high-quality products and services targeted at its niche markets. Railcars are typically leased for multiple-year terms and most of the leases are renewed upon expiration. Due to selective ongoing capital investment, utilization rates (the number of railcars on lease as a percentage of the total fleet) of the railcar fleet are generally high.

Intermodal tank containers are leased through EXSIF Worldwide. EXSIF is a leading international lessor of intermodal tank containers with a fleet of approximately 69,000 units, primarily serving chemical producers and logistics operators.

Crane Services is a provider of mobile cranes and operators in North America and Australia. Sterling Crane, Joyce Crane, Freo Group, and WGC Cranes operate a combined fleet of approximately 1,200 cranes primarily serving the energy, mining, petrochemical and infrastructure markets.

Medical (formed in 2019 through the acquisition of the Colson Medical Companies) develops, manufactures and distributes a wide range of innovative medical devices in the extremities fixation, craniomaxillofacial surgery, neurosurgery, biologics, aesthetics and powered instruments markets. The sector's leading-edge medical technology and products are used globally to help improve patient care and outcomes. Operations are based in the U.S., Europe and China. Business is conducted primarily in North and South America, Europe, Asia and Australia.

Other industrial products

CTB International Corp. ("CTB"), headquartered in Milford, Indiana, is a leading global designer, manufacturer and marketer of a wide range of agricultural systems and solutions for preserving grain, producing poultry, pigs and eggs, and for processing poultry, fish, vegetables and other foods. CTB operates from facilities located around the globe and supports customers through a worldwide network of independent distributors and dealers.

CTB competes with a variety of manufacturers and suppliers, many of which offer only a limited number of the products offered by CTB and two of which offer products across many of CTB's product lines. Competition is based on the price, value, reputation, quality and design of the products offered and the customer service provided by distributors, dealers and manufacturers of the products. CTB's leading brand names, distribution network, diversified product line, product support and high-quality products enable it to compete effectively. CTB manufactures its products primarily from galvanized steel, steel wire, stainless steel and polymer materials and supplies of these materials have been sufficient in recent years.

LiquidPower Specialty Products Inc. ("LSPI"), headquartered in Houston, Texas, is a global leader in the science of drag reduction application ("DRA') technology by maximizing the flow potential of pipelines, increasing operational flexibility and throughput capacity, and efficiencies for customers. LSPI develops innovative flow improver solutions with customers in over 40 countries on six continents, treating over 50 million barrels of hydrocarbon liquids per day. LSPI's DRA offering is part of a comprehensive, full-service solution that encompasses industry-leading technology, quality manufacturing, technical support and consulting, a reliable supply chain, injection equipment and field service. The Scott Fetzer companies are a group of businesses that manufacture, distribute, service and finance a wide variety of products for residential, industrial and institutional use.

Building Products

Clayton Homes

Clayton Homes, Inc. ("Clayton"), headquartered near Knoxville, Tennessee, is a vertically integrated housing company offering traditional site-built homes and off-site built housing – including modular homes, manufactured homes, CrossMod™ homes and tiny homes. In 2020, Clayton delivered 46,765 off-site built and 9,475 site-built homes. Clayton also offers home financing and insurance products and competes on price, service, location and delivery capabilities.

All Clayton Built® off-site homes are designed, engineered and assembled in the United States. As of December 2020, off-site backlog was $1.3 billion, up 237% from prior year. Clayton sells its homes through independent and company owned home centers, realtors and subdivision channels. Clayton considers its ability to make financing available to retail purchasers, a factor affecting the market acceptance of its off-site built homes. Clayton's financing programs utilize proprietary loan underwriting guidelines, which include ability to repay calculations, including debt to income limits, consideration of residual income and credit score requirements, which are considered in evaluating loan applicants.

Since 2015, Clayton's site-built division, Clayton Properties Group, has expanded through the acquisition of nine builders across 14 states with a total of 312 subdivisions, supplementing the portfolio of housing products offered to customers. Clayton's site-builders currently own and control a total of 62,514 homesites, with a home order backlog of approximately $2.2 billion.

Shaw Industries

Shaw Industries Group, Inc. (“Shaw”), headquartered in Dalton, Georgia, is a leading manufacturer and distributor of carpet and flooring products. Shaw designs and manufactures over 3,800 styles of tufted carpet, wood and resilient flooring for residential and commercial use under about 30 brand and trade names and under certain private labels. Shaw also provides project management and installation services. Shaw’s manufacturing operations are fully integrated from the processing of raw materials used to make fiber through the finishing of carpet. In 2018, Shaw acquired Sanquahar Tile Services in Scotland, which manufactures and distributes carpet tile throughout Europe. Shaw also manufactures or distributes a variety of hardwood, wood plastic composite (WPC), stone plastic composite (SPC) and vinyl and laminate floor products (“hard surfaces”). Shaw’s soft and hard surface products are sold in a broad range of patterns, colors and textures. Shaw operates Shaw Sports Turf and Southwest Greens International, LLC, which provide synthetic sports turf, golf greens and landscape turf products.

Shaw products are sold wholesale to over 47,000 retailers, distributors and commercial users throughout the United States, Canada and Mexico and are also exported to various overseas markets. Shaw’s wholesale products are marketed domestically by over 2,100 salaried and commissioned sales personnel directly to retailers and distributors and to large national accounts. Shaw’s seven carpet, nine hard surface, one sample full-service distribution facility, three sample satellite locations and 30 redistribution centers, along with centralized management information systems, enable it to provide prompt and efficient delivery of its products to both its retail customers and wholesale distributors.

Substantially all carpet manufactured by Shaw is tufted carpet made from nylon, polypropylene and polyester. In the tufting process, yarn is inserted by multiple needles into a synthetic backing, forming loops, which may be cut or left uncut, depending on the desired texture or construction. During 2020, Shaw processed approximately 97% of its requirements for carpet yarn in its own yarn processing facilities. The availability of raw materials is adequate but costs are impacted by petro-chemical and natural gas price changes. Raw material cost changes are periodically factored into selling prices to customers.

The soft floor covering industry is highly competitive with only a handful of key players domestically where the majority of Shaw’s business occurs. There are numerous manufacturers, domestically and internationally, that are engaged in hard surface floor covering production, distribution and sales. According to industry estimates, carpet accounts for approximately 44% of the total United States consumption of all flooring types. The principal competitive measures within the floor covering industry are quality, style, price and service.

Johns Manville

Johns Manville (“JM”), headquartered in Denver, Colorado, is a leading manufacturer and marketer of premium-quality products for building insulation, mechanical and industrial insulation, commercial roofing and roof insulation, as well as fibers and nonwovens for commercial, industrial and residential applications. JM serves markets that include aerospace, automotive and transportation, air handling, appliance, HVAC, pipe and equipment, filtration, waterproofing, building, flooring, interiors and wind energy. Fiberglass is the basic material in a majority of JM’s products, although JM also manufactures a significant portion of its products with other materials to satisfy the broader needs of its customers. Raw materials are readily available in sufficient quantities from various sources for JM to maintain and expand its current production levels. JM regards its patents and licenses as valuable, however it does not consider any of its businesses to be materially dependent on any single patent or license. JM operates over 40 manufacturing facilities in North America, Europe and China and conducts research and development at its technical center in Littleton, Colorado and at other facilities in the U.S. and Europe.

Fiberglass is made from earthen raw materials and recycled glass, together with proprietary agents to bind many of its glass fibers. JM’s products also contain materials other than fiberglass, including various chemical and petrochemical-based materials used in roofing and other specialized products. JM uses recycled material when available and suitable to satisfy the broader needs of its customers. The raw materials used in these various products are readily available in sufficient quantities from various sources to maintain and expand its current production levels.

JM’s operations are subject to a variety of federal, state and local environmental laws and regulations, which regulate or impose liability for the discharge of materials into the air, land and water and govern the use and disposal of hazardous substances and use of chemical substances generally. The most relevant of the federal laws are the Federal Clean Air Act, the Clean Water Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act and the Comprehensive Environmental Response, Compensation and Liability Act, which are administered by the EPA. Canadian, European and Asian regulatory authorities have also adopted their own environmental laws and regulations. JM continually monitors new and pending regulations and assesses their potential impact on the business.

JM sells its products through a wide variety of channels including contractors, distributors, retailers, manufacturers and fabricators. JM operates in highly competitive markets, with competitors comprising primarily several large global and national manufacturers and smaller regional manufacturers. JM holds leadership positions in the key markets that it serves. JM's products compete primarily on value, differentiation and customization, and breadth of product line. Sales of JM's products are moderately seasonal due to increases in construction activity that typically occur in the second and third quarters of the calendar year. JM sees a marketplace trend in customer purchasing decisions being influenced by the sustainable and energy efficient attributes of its products, services and operations.

MiTek Industries, Inc.

MiTek Industries, Inc. ("MiTek"), based in Chesterfield, Missouri, operates in two separate markets: residential and commercial. MiTek operates worldwide with sales in over 100 countries and with manufacturing facilities and/or sales/engineering offices located in 21 countries.

In the residential segment, MiTek is a leading supplier of engineered connector products, construction hardware, engineering software and services and computer-driven manufacturing machinery to the truss component market of the building components industry. MiTek's primary customers are component manufacturers who manufacture prefabricated roof and floor trusses and wall panels for the residential building market. MiTek also sells construction hardware to commercial distributors and do-it-yourself retail stores.

MiTek's commercial businesses provide products and services sold to the commercial construction industry. Commercial products include curtain wall systems, masonry and stone anchoring systems, light gauge steel framing products, engineering services for a proprietary high-performance steel frame connection and a comprehensive range of ductwork for the ventilation market, customized air handling systems for commercial, institutional and industrial markets, design and supply of nuclear safety related HVAC systems and components, energy recovery and dehumidification systems for commercial applications and pre-engineered and pre-fabricated custom structural mezzanines and platforms for distribution and manufacturing facilities.

A significant raw material used by MiTek is hot dipped galvanized sheet steel. While supplies are presently adequate, variations in supply have historically occurred, producing significant variations in cost and availability.

Benjamin Moore

Benjamin Moore & Co. ("Benjamin Moore"), headquartered in Montvale, New Jersey, is one of North America's leading manufacturers of premium quality residential, commercial and industrial maintenance coatings. Benjamin Moore is committed to innovation and sustainable manufacturing practices. The Benjamin Moore premium portfolio spans the brand's flagship paint lines including Aura®, Regal® Select, Ultra Spec®, ben®, ADVANCE®, ARBORCOAT® and more. The Benjamin Moore diversified brands include specialty and architectural paints from Coronado®, Insl-x® and Lenmar®. Benjamin Moore coatings are available from its more than 7,500 independently owned and operated paint, decorating and hardware retailers throughout the United States and Canada as well as 75 countries globally. In July 2019, Benjamin Moore announced the expansion of its relationship with Ace Hardware ("Ace"), through which Benjamin Moore has become the preferred paint supplier for approximately 3,300 Ace Hardware stores, which are included in the count above. Through this agreement, these Ace stores are afforded the opportunity to carry a full line premium assortment of Benjamin Moore products or a streamlined offering of Regal® Select and ben®, or ben® only branded products. As part of the expansion, Benjamin Moore assumed responsibility for manufacturing Clark+Kensington® and Royal®, as well as the balance of Ace's private label paint brands.

In addition, Benjamin Moore operates an online "pick up in store" program, which allows consumers to place orders via an e-commerce site or, for national accounts and government agencies, via its customer information center. These orders may be picked up at the customer's nearest retailer or delivered. For national accounts, drop-ship orders can be fulfilled by Benjamin Moore if a minimum gallon threshold is met.

Benjamin Moore competes with numerous manufacturers, distributors and paint, coatings and related products retailers. Product quality, product innovation, breadth of product line, technical expertise, service and price determine the competitive advantage. Competitors include other paint and decorating stores, mass merchandisers, home centers, independent hardware stores, hardware chains and manufacturer-operated direct outlets, such as Sherwin-Williams Company, PPG Industries, Inc., The Valspar Corporation, The Home Depot, Inc. and Lowe's Companies, Inc.

The most significant raw materials in Benjamin Moore products are titanium dioxide, monomers, polymers and pigments. Historically, these materials have been generally available, with pricing and availability subject to fluctuation.

Acme Brick

Acme Brick Company ("Acme"), headquartered in Fort Worth, Texas, manufactures and distributes clay bricks (Acme Brick®) and concrete block (Featherlite). In addition, Acme distributes numerous other building products of other manufacturers, including floor and wall tile, wood flooring and other masonry products. Products are sold primarily in the South Central and South Eastern United States through company-operated sales offices. Acme distributes products primarily to homebuilders and masonry and general contractors.

In 2018 and 2019, Acme closed multiple underperforming manufacturing and sales facilities. Acme operates 12 clay brick manufacturing sites located in four states, three concrete block facilities and a quarrying operation all located in Texas. The demand for Acme's products is seasonal, with higher sales in the warmer weather months, and is subject to the level of construction activity, which is cyclical. Acme also owns and leases properties and mineral rights that supply raw materials used in many of its manufactured products. Acme's raw materials supply is believed to be adequate.

The brick industry is subject to the EPA Maximum Achievable Control Technology Standards ("MACT"). As required under the 1990 Clean Air Act, the EPA developed a list of source categories that require the development of National Emission Standards for Hazardous Air Pollutants, which are also referred to as MACT Standards ("Rule"). Key elements of the MACT Rule include emission limits established for certain hazardous air pollutants and acidic gases. Acme's brick plants are in compliance with the current Rule.

Consumer Products

Apparel

Fruit of the Loom ("FOL"), headquartered in Bowling Green, Kentucky, is primarily a manufacturer and distributor of basic apparel, underwear, casualwear, athletic apparel and sports equipment. Products under the Fruit of the Loom® and JERZEES® labels are primarily sold in the mass merchandise, mid-tier chains and wholesale markets. In the Vanity Fair Brands product line, Vassarette®, Curvation® and Radiant® by Vanity Fair are sold in the mass merchandise market, while Vanity Fair® and Lily of France® products are sold to mid-tier chains and department stores. FOL also markets and sells apparel, sports equipment and balls to team dealers and athletic apparel, sports equipment and balls to sporting goods retailers under the Russell Athletic® and Spalding® brands. Additionally, Spalding® markets and sells balls and sports equipment in the mass merchandise market and dollar store channels. In 2020, approximately 58% of FOL's sales were to five customers.

FOL generally performs its own knitting, cloth finishing, cutting, sewing and packaging for apparel. For the North American market, which is FOL's predominant sales region, the majority of FOL's cloth manufacturing is performed in Honduras. Labor-intensive cutting, sewing and packaging operations are located in Central America, the Caribbean and Vietnam. For the European market, products are either sourced from third-party contractors in Europe or Asia or sewn in Morocco from textiles internally produced in Morocco. Manufacturing of bras, athletic equipment, sporting goods and other athletic apparel lines are generally sourced from third-party contractors located primarily in Asia.

U.S. grown cotton and polyester fibers are the main raw materials used in the manufacturing of FOL's apparel products and are purchased from a limited number of third-party suppliers. In 2015, FOL entered into an eight-year agreement with one key supplier to provide the majority of FOL's yarn. Management currently believes there are readily available alternative sources of raw materials and yarn. However, if relationships with suppliers cannot be maintained or delays occur in obtaining alternative sources of supply, production could be adversely affected, which could have a corresponding adverse effect on results of operations. Additionally, raw materials are subject to price volatility caused by weather, supply conditions, government regulations, economic climate and other unpredictable factors. FOL has secured contracts to purchase cotton, either directly or through the yarn suppliers, to meet a large percentage of its production plans for 2021. FOL's markets are highly competitive, consisting of many domestic and foreign manufacturers and distributors. Competition is generally based upon product features, quality, customer service and price.

Garan, headquartered in New York, New York designs, manufactures, imports and sells apparel primarily for children, including boys, girls, toddlers and infants. Products are sold under its own trademark Garanimals® and customer private label brands. Garan conducts its business through operating subsidiaries located in the United States, Central America and Asia. Garan's products are sold through its distribution centers in the United States. Fechheimer Brothers manufactures, distributes and sells uniforms, principally for the public service and safety markets, including police, fire, postal and military markets. Fechheimer Brothers is based in Cincinnati, Ohio.

The BH Shoe Holdings Group, headquartered in Greenwich, Connecticut, manufactures and distributes work, rugged outdoor and casual shoes and western-style footwear under a number of brand names, including Justin, Tony Lama®, Chippewa®, BØRN®, B•Ø•C®, Carolina®, EuroSofft, Söfft, Double-H Boots®, Nursemates® and Comfortiva®. Brooks Sports, headquartered in Seattle, Washington, markets and sells performance running footwear and apparel to specialty and national retailers and directly to consumers under the Brooks® brand. A significant volume of the shoes sold by Berkshire's shoe businesses are manufactured or purchased from sources located outside the United States. Products are sold worldwide through a variety of channels including department stores, footwear chains, specialty stores, catalogs and the Internet, as well as through company-owned retail stores.

Other consumer products

Forest River, Inc. ("Forest River") is a manufacturer of recreational vehicles ("RV"), utility cargo trailers, buses and pontoon boats, headquartered in Elkhart, Indiana with products sold in the United States and Canada through an independent dealer network. Forest River has numerous manufacturing facilities located in seven states. Forest River is a leading manufacturer of RVs with numerous brand names, including Forest River, Coachmen RV and Prime Time. Utility cargo trailers are sold under a variety of brand names. Buses are sold under several brand names, including Starcraft Bus. Pontoon boats are sold under the Berkshire, South Bay and Trifecta brand names. The RV industry is very competitive. Competition is based primarily on price, design, quality and service. The industry has consolidated over the past several years and is currently concentrated in a few companies, the largest of which had a market share of approximately 42% based on industry data as of December 2020. Forest River held a market share of approximately 37% at that time.

The Duracell Company ("Duracell'), headquartered in Chicago, Illinois, is a leading manufacturer of high-performance alkaline batteries. Duracell manufactures batteries in the U.S., Europe and China and provides a network of worldwide sales and distribution centers. Costco and Walmart are significant customers, representing approximately 23% of Duracell's annual revenue. There are several competitors in the battery manufacturing market with Duracell holding an approximately 31% market share of the global alkaline battery market. Management believes there are currently sufficient sources of raw materials available, which are primarily steel, zinc and manganese.

Albecca Inc. ("Albecca"), headquartered in Norcross, Georgia, operates in the U.S., Canada and 12 other countries, with products primarily under the Larson-Juhl® name. Albecca designs, manufactures and distributes a complete line of high quality, branded custom framing products, including wood and metal moulding, matboard, foamboard, glass and framing supplies. Complementary to its framing products, Albecca offers art printing and fulfillment services.

Richline Group, Inc., headquartered in New York, New York, operates five strategic business units: Richline Jewelry, Richline Digital, LeachGarner, Rio Grande and Inverness. Each business unit is a manufacturer and/or distributor of precious metal and non-precious metal products to specific target markets including large jewelry chains, department stores, shopping networks, mass merchandisers, e-commerce retailers and artisans plus worldwide manufacturers and wholesalers and the medical, electronics and aerospace industries.

Service and Retailing Businesses

Service Businesses

Berkshire's service businesses provide grocery and foodservice distribution, professional aviation training programs, shared aircraft ownership programs and distribution of electronic components. Other service businesses include franchising and servicing of quick service restaurants, media businesses (television and information distribution), as well as logistics businesses. Berkshire's service businesses employed approximately 45,000 people at the end of 2020. Information concerning these activities follows.

McLane Company

McLane Company, Inc. ("McLane") provides wholesale distribution services in all 50 states to customers that include convenience stores, discount retailers, wholesale clubs, drug stores, military bases, quick service restaurants and casual dining restaurants. McLane provides wholesale distribution services to Walmart, which accounted for approximately 18% of McLane's revenues in 2020. McLane's other significant customers include 7-Eleven (approximately 13% of revenues) and Yum! Brands, (approximately 11% of revenues). McLane's business model is based on a high volume of sales, rapid inventory turnover and stringent expense controls. Operations are currently divided into three business units: grocery distribution, foodservice distribution and beverage distribution.

McLane's grocery distribution unit, based in Temple, Texas, maintains a dominant market share within the convenience store industry and serves most of the national convenience store chains and major oil company retail outlets. Grocery operations provide products to approximately 50,000 retail locations nationwide, including Walmart. McLane's grocery distribution unit operates 25 distribution facilities in 20 states.

McLane's foodservice distribution unit, based in Carrollton, Texas, focuses on serving the quick service and casual dining restaurant industry with high quality, timely-delivered products. Operations are conducted through 46 facilities in 22 states. The foodservice distribution unit services approximately 33,200 restaurants nationwide.

Through its subsidiaries, McLane also operates wholesale distributors of distilled spirits, wine and beer. The beverage unit operates as Empire Distributors and operations are conducted through 14 distribution centers in Georgia, North Carolina, Tennessee and Colorado. Empire Distributors services approximately 25,600 retail locations in the southeastern United States and Colorado.

FlightSafety International

FlightSafety International Inc. ("FlightSafety") is an industry leading provider of professional aviation training services and flight simulation products. FlightSafety and FlightSafety Textron Aviation Training, a joint venture with Textron which began operations in 2019, provide high technology training to pilots, aircraft maintenance technicians, flight attendants and dispatchers who operate and support a wide variety of business, commercial and military aircraft. The training is provided using a large fleet of advanced full flight simulators at learning centers and training locations in the United States, Australia, Brazil, Canada, France, Hong Kong, Japan, Norway, South Africa and the United Kingdom. The vast majority of the instructors, training programs and flight simulators are qualified by the United States Federal Aviation Administration and other aviation regulatory agencies around the world.

FlightSafety is also a leader in the design and manufacture of full flight simulators, visual systems, displays and other advanced technology training devices. This equipment is used to support FlightSafety training programs and is offered for sale to airlines and government and military organizations around the world. Manufacturing facilities are located in Oklahoma, Missouri and Texas. FlightSafety strives to maintain and manufacture simulators and develop courseware using state-of-the-art technology and invests in research and development as it builds new equipment and training programs.

NetJets

NetJets Inc. ("NetJets") is the world's leading provider of shared ownership programs for general aviation aircraft. NetJets' global headquarters is located in Columbus, Ohio, with most of its logistical and flight operations based at John Glenn Columbus International Airport. NetJets' European operations are based in Lisbon, Portugal. The shared ownership concept is designed to meet the travel needs of customers who require the scale, flexibility and access of a large fleet that whole aircraft ownership cannot deliver. In addition, shared ownership programs are available for corporate flight departments seeking to outsource their general aviation needs or add capacity for peak periods and for others that previously chartered aircraft.

With a focus on safety and service, NetJets' programs are designed to offer customers guaranteed availability of aircraft, predictable operating costs and increased liquidity. NetJets' shared aircraft ownership programs permit customers to acquire a specific percentage of a certain aircraft type and allows customers to utilize the aircraft for a specified number of flight hours annually. In addition, NetJets offers prepaid flight cards and other aviation solutions and services for aircraft management, customized aircraft sales and acquisition, ground support and flight operation services under a number of programs including NetJets Shares™, NetJets Leases™ and the Marquis Jet Card®.

NetJets is subject to the rules and regulations of the United States Federal Aviation Administration, the Portuguese Civil Aviation Authority and the European Union Aviation Safety Agency. Regulations address aircraft registration, maintenance requirements, pilot qualifications and airport operations, including flight planning and scheduling as well as security issues and other matters. NetJets maintains a comprehensive training and development program in compliance with regulatory requirements for pilots, flight attendants, maintenance mechanics, and other flight operations specialists.

TTI, Inc.

TTI, Inc. ("TTI"), headquartered in Fort Worth, Texas, is a global specialty distributor of passive, interconnect, electromechanical, discrete, and semiconductor components used by customers in the manufacturing and assembling of electronic products. TTI's customer base includes original equipment manufacturers, electronic manufacturing services, original design manufacturers and military and commercial customers, as well as design and system engineers. TTI's distribution agreements with the industry's leading suppliers allow it to uniquely leverage its product cost and to expand its business by providing new lines and products to its customers. TTI operates sales offices and distribution centers from more than 100 locations throughout North America, Europe, Asia and Israel.

TTI services a variety of industries including telecommunications, medical devices, computers and office equipment, military/aerospace, automotive and industrial electronics. TTI's core customers include businesses in the design through production stages in the electronic component supply chain, which supports its high-volume business, and its Mouser subsidiary, which supports a broader base of customers with lower volume purchases through internet-based marketing.

Other services

XTRA Corporation ("XTRA"), headquartered in St. Louis, Missouri, is a leading transportation equipment lessor operating under the XTRA Lease® brand name. XTRA manages a diverse fleet of approximately 86,000 units located at 48 facilities throughout the United States. The fleet includes over-the-road and storage trailers, chassis, temperature-controlled vans and flatbed trailers. XTRA is one of the largest lessors (in terms of units available) of over-the-road trailers in North America. Transportation equipment customers lease equipment to cover cyclical, seasonal and geographic needs and as a substitute for purchasing equipment. Therefore, as a provider of marginal capacity to its customers, XTRA's utilization rates and operating results tend to be cyclical. In addition, transportation providers often use leasing to maximize their asset utilization and reduce capital expenditures. By maintaining a large fleet, XTRA is able to provide customers with a broad selection of equipment and quick response times.

International Dairy Queen develops and services a worldwide system of over 7,000 franchised restaurants operating primarily under the names DQ Grill and Chill®, Dairy Queen® and Orange Julius® that offer various dairy desserts, beverages, prepared foods and blended fruit drinks. Business Wire provides electronic dissemination of full-text news releases to the media, online services and databases and the global investment community in 150 countries and in 45 languages. Approximately 93% of Business Wire's revenues derive from its core news distribution business. CORT Business Services Corporation is a leading national provider of rental furniture and related services in the "rent-to-rent" segment of the furniture rental industry. CORT's primary revenue streams include furniture rental to individuals, businesses, government agencies, the trade show and events industry and retail sales of used furniture. WPLG, Inc. is an ABC affiliate broadcast station in Miami, Florida and Charter Brokerage is a leading non-asset based third party logistics provider to the petroleum and chemical industries. Until March 2020, other services included the newspaper publishing businesses conducted through The Buffalo News and BH Media Group, Inc. These operations were sold in 2020.

Retailing Businesses

Berkshire's retailing businesses include automotive, home furnishings and several other operations that sell various consumer products to consumers. Information regarding each of these operations follows. Berkshire's retailing businesses employed approximately 25,000 people at the end of 2020.

Berkshire Hathaway Automotive

The Berkshire Hathaway Automotive Group, Inc. ("BHA") is one of the largest automotive retailers in the United States, currently operating 104 new vehicle franchises through 81 dealerships located primarily in major metropolitan markets in the United States. The dealerships sell new and used vehicles, vehicle maintenance and repair services, extended service contracts, vehicle protection products and other aftermarket products. BHA also arranges financing for its customers through third-party lenders. BHA operates 29 collision centers directly connected to the dealerships' operations and owns and operates two auto auctions and a fluid maintenance products distribution company.

Dealership operations are highly concentrated in the Arizona and Texas markets, with approximately 70% of dealership-related revenues derived from sales in these markets. BHA currently maintains franchise agreements with 27 different vehicle manufacturers, although it derives a significant portion of its revenue from the Toyota/Lexus, General Motors, Ford/Lincoln, Nissan/Infiniti and Honda/Acura brands. Approximately 90% of BHA's annual revenues are from dealerships representing these manufacturers.

The retail automotive industry is highly competitive. BHA faces competition from other large public and private dealership groups, as well as individual franchised dealerships and competition via the Internet. Given the pricing transparency available via the Internet, and the fact that franchised dealers acquire vehicles from the manufacturers on the same terms irrespective of volume, the location and quality of the dealership facility, customer service and transaction speed are key differentiators in attracting customers.

BHA's overall relationships with the automobile manufacturers are governed by framework agreements. The framework agreements contain provisions relating to the management, operation, acquisition and the ownership structure of BHA's dealerships. Failure to meet the terms of these agreements could adversely impact BHA's ability to acquire additional dealerships representing those manufacturers. Additionally, these agreements contain limitations on the number of dealerships from a specific manufacturer that may be owned by BHA.

Individual dealerships operate under franchise agreements with the manufacturer, which grants the dealership entity a non-exclusive right to sell the manufacturer's brand of vehicles and offer related parts and service within a specified market area, as well as the right to use the manufacturer's trademarks. The agreements contain various requirements and restrictions related to the management and operation of the franchised dealership and provide for termination of the agreement by the manufacturer or non-renewal for a variety of causes. The states generally have automotive dealership franchise laws that provide substantial protection to the franchisee, and it is difficult for a manufacturer to terminate or not renew a franchise agreement outside of bankruptcy or with "good cause" under the applicable state franchise law.

BHA also develops, underwrites and administers various vehicle protection plans as well as life and accident and health insurance plans sold to consumers through BHA's dealerships and third-party dealerships. BHA also develops proprietary training programs and materials and provides ongoing monitoring and training of the dealership's finance and insurance personnel.

Home furnishings retailing

The home furnishings businesses consist of Nebraska Furniture Mart ("NFM"), R.C. Willey Home Furnishings ("R.C. Willey"), Star Furniture Company ("Star") and Jordan's Furniture, Inc. ("Jordan's"). These businesses offer a wide selection of furniture, bedding and accessories. In addition, NFM and R.C. Willey sell a full line of major household appliances, electronics, computers and other home furnishings and offer customer financing to complement their retail operations. An important feature of each of these businesses is their ability to control costs and to produce high business volume by offering significant value to their customers.

NFM operates its business from four retail complexes with almost 4.5 million square feet of retail, warehouse and administrative facilities located in Omaha, Nebraska, Clive, Iowa, Kansas City, Kansas and The Colony, Texas. NFM also owns Homemakers Furniture located in Urbandale, Iowa, which has approximately 600,000 square feet of retail, warehouse and administrative space. NFM is the largest furniture retailer in each of these markets. R.C. Willey, based in Salt Lake City, Utah, currently operates twelve full-line retail home furnishings stores and three distribution centers. These facilities include approximately 1.5 million square feet of retail space with six stores located in Utah, one store in Meridian, Idaho, three stores in Nevada (Las Vegas and Reno) and two stores in the Sacramento, California area.

Jordan's operates a retail furniture business from seven locations with approximately 890,000 square feet of retail space in stores located in Massachusetts, New Hampshire, Rhode Island, Maine and Connecticut. The retail stores are supported by an 800,000 square foot distribution center in Taunton, Massachusetts. Jordan's is the largest furniture retailer, as measured by sales, in Massachusetts and New Hampshire. Jordan's is well known in its markets for its unique store arrangements and advertising campaigns. Star has operated home furnishings retail stores in Texas for many years. Star's retail facilities currently include about 700,000 square feet of retail space in 11 locations in Texas, including eight in Houston.

Other retailing

Borsheim Jewelry Company, Inc. ("Borsheims") operates from a single store in Omaha, Nebraska. Borsheims is a high-volume retailer of fine jewelry, watches, crystal, china, stemware, flatware, gifts and collectibles. Helzberg's Diamond Shops, LLC. ("Helzberg") is based in North Kansas City, Missouri, and operates a chain of 213 retail jewelry stores in 36 states, which includes approximately 500,000 square feet of retail space. Helzberg's stores are located in malls, lifestyle centers, power strip centers and outlet malls, and all stores operate under the name Helzberg Diamonds® or Helzberg Diamonds Outlet®. The Ben Bridge Corporation ("Ben Bridge Jeweler"), based in Seattle, Washington, operates 75 retail jewelry stores under three different brand names, located primarily in major shopping malls in 10 western states and in British Columbia, Canada. Thirty-six of its retail locations are upscale jewelry stores selling loose diamonds, finished jewelry and high-end timepieces. Thirty-eight of its retail locations are concept stores operating under a franchise agreement that sell only Pandora jewelry. One store is a Breitling concept store, selling only Breitling timepieces.

See's Candies ("See's") produces boxed chocolates and other confectionery products with an emphasis on quality and distinctiveness in two large kitchens in Los Angeles and San Francisco and one smaller facility in Burlingame, California. See's operates approximately 250 retail and quantity discount stores located mainly in California and other Western states, as well as over 110 seasonal in-line locations. See's revenues are highly seasonal with approximately half of its annual revenues earned in the fourth quarter.

The Pampered Chef, Ltd. ("Pampered Chef") is a premier direct seller of distinctive high-quality kitchenware products with sales and operations in the United States, Canada, Germany, Austria and France and operations in China. Pampered Chef's product portfolio consists of approximately 650 Pampered Chef® branded kitchenware items in categories ranging from stoneware and cutlery to grilling and entertaining. Pampered Chef's products are available through its sales force of independent cooking consultants and online.

Oriental Trading Company ("OTC") is a leading multi-channel retailer and online destination for value-priced party supplies, arts and crafts, toys and novelties, school supplies, educational games, patient giveaways and personalized products. OTC, headquartered in Omaha, Nebraska, serves a broad base of nearly four million customers annually, including consumers, schools, churches, non-profit organizations, medical and dental offices and other businesses. OTC offers a unique assortment of over 50,000 products and utilizes sophisticated digital and print marketing efforts to drive significant traffic and industry leading customer satisfaction.

Detlev Louis Motorrad ("Louis"), headquartered in Hamburg, Germany, is a leading retailer of motorcycle apparel and equipment in Europe. Louis carries over 32,000 different products from more than 600 manufacturers, primarily covering the clothing, technical equipment and leisure markets. Louis has over 80 stores in Germany, Austria, Switzerland and the Netherlands and also sells through catalogs and via the Internet throughout most of Europe.

Additional information with respect to Berkshire's businesses

Revenue, earnings before taxes and identifiable assets attributable to Berkshire's reportable business segments are included in Note 27 to Berkshire's Consolidated Financial Statements contained in Item 8, Financial Statements and Supplementary Data. Additional information regarding Berkshire's investments in fixed maturity and equity securities is included in Notes 3 and 4, respectively, to Berkshire's Consolidated Financial Statements.

Berkshire owns 26.6% of the outstanding common stock of The Kraft Heinz Company ("Kraft Heinz"). Kraft Heinz is one of the largest food and beverage companies in the world, with sales in numerous countries within developed and emerging markets and territories. Kraft Heinz manufactures and markets food and beverage products, including condiments and sauces, cheese and dairy meals, meats, refreshment beverages, coffee and other grocery products, throughout the world, under a diverse mix of iconic and emerging brands. Berkshire subsidiaries also own a 50% joint venture interest in Berkadia Commercial Mortgage LLC ("Berkadia"), a 38.6% interest in Pilot Travel Centers LLC ("Pilot") and a 50% joint venture interest in Electric Transmission Texas, LLC ("ETT"). Information concerning these investments is included in Note 5 to Berkshire's Consolidated Financial Statements.

Berkshire maintains a website (*http://www.berkshirehathaway.com*) where its annual reports, certain corporate governance documents, press releases, interim shareholder reports and links to its subsidiaries' websites can be found. Berkshire's periodic reports filed with the SEC, which include Form 10-K, Form 10-Q, Form 8-K and amendments thereto, may be accessed by the public free of charge from the SEC and through Berkshire. Electronic copies of these reports can be accessed at the SEC's website (*http://www.sec.gov*) and indirectly through Berkshire's website (*http://www.berkshirehathaway.com*). Copies of these reports may also be obtained, free of charge, upon written request to: Berkshire Hathaway Inc., 3555 Farnam Street, Omaha, NE 68131, Attn: Corporate Secretary.

Item 1A. Risk Factors

Berkshire and its subsidiaries (referred to herein as "we," "us," "our" or similar expressions) are subject to certain risks and uncertainties in its business operations which are described below. The risks and uncertainties described below are not the only risks we face. Additional risks and uncertainties that are presently unknown or are currently deemed immaterial may also impair our business operations.

General Business Risks

Terrorist acts could hurt our operating businesses.

A cyber, biological, nuclear or chemical attack could produce significant losses to our worldwide operations. Our business operations could be adversely affected from such acts through the loss of human resources or destruction of production facilities and information systems. We share the risk with all businesses.

Cyber security risks

We rely on technology in virtually all aspects of our business. Like those of many large businesses, certain of our information systems have been subject to computer viruses, malicious codes, unauthorized access, phishing efforts, denial-of-service attacks and other cyber-attacks and we expect to be subject to similar attacks in the future as such attacks become more sophisticated and frequent. A significant disruption or failure of our technology systems could result in service interruptions, safety failures, security events, regulatory compliance failures, an inability to protect information and assets against unauthorized users and other operational difficulties. Attacks perpetrated against our systems could result in loss of assets and critical information and expose us to remediation costs and reputational damage.

Although we have taken steps intended to mitigate these risks, including business continuity planning, disaster recovery planning and business impact analysis, a significant disruption or cyber intrusion could adversely affect our results of operations, financial condition and liquidity. Additionally, if we are unable to acquire, develop, implement, adopt or protect rights around new technology, we may suffer a competitive disadvantage, which could also have an adverse effect on our results of operations, financial condition and/or liquidity.

Cyber-attacks could further adversely affect our ability to operate facilities, information technology and business systems or compromise confidential customer and employee information. Political, economic, social or financial market instability or damage to or interference with our operating assets, customers or suppliers from cyber-attacks may result in business interruptions, lost revenues, higher commodity prices, disruption in fuel supplies, lower energy consumption, unstable markets, increased security, repair or other costs, or may materially adversely affect us in ways that cannot be predicted at this time. Any of these risks could materially affect our consolidated financial results. Furthermore, instability in the financial markets resulting from terrorism, sustained or significant cyber-attacks or war could also have a material adverse effect on our ability to raise capital. We share these risks with all businesses.

We are dependent on a few key people for our major investment and capital allocation decisions.

Major investment decisions and all major capital allocation decisions are made by Warren E. Buffett, Chairman of the Board of Directors and Chief Executive Officer, age 90, in consultation with Charles T. Munger, Vice Chairman of the Board of Directors, age 97. If for any reason the services of our key personnel, particularly Mr. Buffett, were to become unavailable, there could be a material adverse effect on our operations. However, Berkshire's Board of Directors has identified certain current Berkshire managers who, in their judgment, are capable of succeeding Mr. Buffett and has agreed on a replacement for Mr. Buffett should a replacement be needed currently. The Board continually monitors this risk and could alter its current view regarding a replacement for Mr. Buffett in the future. We believe that the Board's succession plan, together with the outstanding managers running our numerous and highly diversified operating units helps to mitigate this risk. In 2018, Berkshire's Board of Directors appointed Mr. Gregory Abel as Vice Chairman of Berkshire's non-insurance operations and Mr. Ajit Jain as Vice Chairman of Berkshire's insurance operations. Mr. Abel and Mr. Jain each report directly to Mr. Buffett and Mr. Buffett continues to be responsible for major capital allocation and investment decisions.

We need qualified personnel to manage and operate our various businesses.

In our decentralized business model, we need qualified and competent management to direct day-to-day business activities of our operating subsidiaries and to manage changes in future business operations due to changing business or regulatory environments. Our operating subsidiaries also need qualified and competent personnel in executing their business plans and serving their customers, suppliers and other stakeholders. Our inability to recruit and retain qualified and competent managers and personnel could negatively affect the operating results, financial condition and liquidity of our subsidiaries and Berkshire as a whole.

Investments are unusually concentrated in equity securities and fair values are subject to loss in value.

We concentrate a high percentage of the equity security investments of our insurance subsidiaries in a relatively small number of equity securities. A significant decline in the fair values of our larger investments in equity securities may produce a material decline in our consolidated shareholders' equity and our consolidated earnings.

Since a large percentage of our equity securities are held by our insurance subsidiaries, significant decreases in the fair values of these investments will produce significant declines in the statutory surplus of our insurance business. Our large statutory surplus is a competitive advantage, and a long-term material decline could have an adverse effect on our claims-paying ability ratings and our ability to write new insurance business thus potentially reducing our future underwriting profits.

Over ten years ago, we assumed the risk of potentially significant losses under a number of equity index put option contracts, which contain equity price risks. Most of the contracts remaining at year end 2020 will expire by February 2023. Risks of losses under these contracts are based on declines in equity prices of stocks comprising certain major U.S. and international stock indexes. We received considerable cash premiums as compensation for accepting these risks. Absent major reductions in future equity securities prices, our ultimate payment obligations are not likely to be significant. Nevertheless, there can be no assurance that equity securities prices will not decline significantly resulting in significant settlement payments upon contract expirations.

Competition and technology may erode our business franchises and result in lower earnings.

Each of our operating businesses face intense competition within markets in which they operate. While we manage our businesses with the objective of achieving long-term sustainable growth by developing and strengthening competitive advantages, many factors, including technological changes, may erode or prevent the strengthening of competitive advantages. Accordingly, our future operating results will depend to some degree on our operating units successfully protecting and enhancing their competitive advantages. If our operating businesses are unsuccessful in these efforts, our periodic operating results in the future may decline.

Unfavorable general economic conditions may significantly reduce our operating earnings and impair our ability to access capital markets at a reasonable cost.

Our operating businesses are subject to normal economic cycles affecting the general economy or the specific industries in which they operate. Significant deteriorations of economic conditions over a prolonged period could produce a material adverse effect on one or more of our significant operations. In addition, our utilities and energy businesses and our railroad business regularly utilize debt as a component of their capital structures and depend on having access to borrowed funds through the capital markets at reasonable rates. To the extent that access to the capital markets is restricted or the cost of funding increases, these operations could be adversely affected.

Epidemics, pandemics or other outbreaks, including COVID-19, could hurt our operating businesses.

The outbreak of COVID-19 has adversely affected, and in the future it or other epidemics, pandemics or outbreaks may adversely affect, our operations, including our equity securities portfolio. This is or may be due to closures or restrictions requested or mandated by governmental authorities, disruption to supply chains and workforce, reduction of demand for our products and services, credit losses when customers and other counterparties fail to satisfy their obligations to us, and volatility in global equity securities markets, among other factors. We share most of these risks with all businesses.

Regulatory changes may adversely impact our future operating results.

Over time, in response to financial markets crises, global economic recessions, and social and environmental issues, regulatory initiatives were adopted in the United States and elsewhere. Such initiatives addressed for example, the regulation of banks and other major financial institutions, products and environmental and global-warming matters. These initiatives impact all of our businesses, albeit in varying ways. Increased regulatory compliance costs could have a significant negative impact on our operating businesses, as well as on the businesses in which we have a significant, but not controlling economic interests. We cannot predict whether such initiatives will have a material adverse impact on our consolidated financial position, results of operations and/or cash flows.

Data privacy regulations have recently been enacted in various jurisdictions in the U.S. and throughout the world. These regulations address numerous aspects related to the security of personal information that is stored in our information systems, networks and facilities. Failure to comply with these regulations could result in reputational damage and significant penalties.

<u>Risks unique to our regulated businesses</u>

Our tolerance for risk in our insurance businesses may result in significant underwriting losses.

When properly paid for the risk assumed, we have been and will continue to be willing to assume more risk from a single event than any other insurer has knowingly assumed. Accordingly, we could incur a significant loss from a single catastrophe event resulting from a natural disaster or man-made catastrophes such as terrorism or cyber-attacks. We employ various disciplined underwriting practices intended to mitigate potential losses and attempt to take into account all possible correlations and avoid writing groups of policies from which pre-tax losses from a single catastrophe event might aggregate above $10 billion. Currently, we estimate that our aggregate exposure from a single event under outstanding policies is significantly below $10 billion. However, despite our efforts, it is possible that losses could manifest in ways that we do not anticipate and that our risk mitigation strategies are not designed to address. Additionally, various provisions of our policies, such as limitations or exclusions from coverage, negotiated to limit our risks, may not be enforceable in the manner we intend. Our tolerance for significant insurance losses may result in lower reported earnings in a future period.

The degree of estimation error inherent in the process of estimating property and casualty insurance loss reserves may result in significant underwriting losses.

The principal cost associated with the property and casualty insurance business is claims. In writing property and casualty insurance policies, we receive premiums today and promise to pay covered losses in the future. However, it will take decades before all claims that have occurred as of any given balance sheet date will be reported and settled. Although we believe that liabilities for unpaid losses are adequate, we will not know whether these liabilities or the premiums charged for the coverages provided were sufficient until well after the balance sheet date. Estimating insurance claim costs is inherently imprecise. Our estimated unpaid losses arising under contracts covering property and casualty insurance risks are large ($120.8 billion at December 31, 2020), and a small percentage increase to those liabilities can result in materially lower reported earnings.

Changes in regulations and regulatory actions can adversely affect our operating results and our ability to allocate capital.

Our insurance businesses are subject to regulation in the jurisdictions in which we operate. Such regulations may relate to among other things, the types of business that can be written, the rates that can be charged for coverage, the level of capital that must be maintained, and restrictions on the types and size of investments that can be made. Regulations may also restrict the timing and amount of dividend payments to Berkshire by these businesses. U.S. state insurance regulators and international insurance regulators are also actively developing various regulatory mechanisms to address the regulation of large internationally active insurance groups, including regulations concerning group capital, liquidity, governance and risk management. Accordingly, changes in regulations related to these or other matters or regulatory actions imposing restrictions on our insurance businesses may adversely impact our results of operations and restrict our ability to allocate capital.

Our railroad business conducted through BNSF is also subject to a significant number of laws and regulations with respect to rates and practices, taxes, railroad operations and a variety of health, safety, labor, environmental and other matters. Failure to comply with applicable laws and regulations could have a material adverse effect on BNSF's business. Governments may change the legislative and/or regulatory framework within which BNSF operates, without providing any recourse for any adverse effects that the change may have on the business. Complying with legislative and regulatory changes may pose significant operating and implementation risks and require significant capital expenditures.

BNSF derives significant amounts of revenue from the transportation of energy-related commodities, particularly coal. To the extent that changes in government policies limit or restrict the usage of coal as a source of fuel in generating electricity or alternate fuels, such as natural gas, or displace coal on a competitive basis, revenues and earnings could be adversely affected. As a common carrier, BNSF is also required to transport toxic inhalation hazard chemicals and other hazardous materials. A release of hazardous materials could expose BNSF to significant claims, losses, penalties and environmental remediation obligations. Changes in the regulation of the rail industry could negatively impact BNSF's ability to determine prices for rail services and to make capital improvements to its rail network, resulting in an adverse effect on our results of operations, financial condition and/or liquidity.

Our utilities and energy businesses operated under BHE are highly regulated by numerous federal, state, local and foreign governmental authorities in the jurisdictions in which they operate. These laws and regulations are complex, dynamic and subject to new interpretations or change. Regulations affect almost every aspect of our utilities and energy businesses. Regulations broadly apply and may limit management's ability to independently make and implement decisions regarding numerous matters including: acquiring businesses; constructing, acquiring, disposing or retiring of operating assets; operating and maintaining generating facilities and transmission and distribution system assets; complying with pipeline safety and integrity and environmental requirements; setting rates charged to customers; establishing capital structures and issuing debt; transacting between our domestic utilities and our other subsidiaries and affiliates; and paying dividends or similar distributions. Failure to comply with or reinterpretations of existing regulations and new legislation or regulations, such as those relating to air and water quality, renewable portfolio standards, emissions performance standards, climate change, coal combustion byproduct disposal, hazardous and solid waste disposal, protected species and other environmental matters, or changes in the nature of the regulatory process may have a significant adverse impact on our financial results.

Our railroad business requires significant ongoing capital investment to improve and maintain its railroad network so that transportation services can be safely and reliably provided to customers on a timely basis. Our utilities and energy businesses also require significant amounts of capital to construct, operate and maintain generation, transmission and distribution systems to meet their customers' needs and reliability criteria. Additionally, system assets may need to be operational for long periods of time in order to justify the financial investment. The risk of operational or financial failure of capital projects is not necessarily recoverable through rates that are charged to customers. Further, a significant portion of costs of capital improvements may be funded through debt issued by BNSF and BHE and their subsidiaries. Disruptions in debt capital markets that restrict access to funding when needed could adversely affect the results of operations, liquidity and/or capital resources of these businesses.

Item 1B. Unresolved Staff Comments

None.

Item 2. Description of Properties

The properties used by Berkshire's business segments are summarized in this section. Berkshire's railroad and utilities and energy businesses, in particular, utilize considerable physical assets in their businesses.

Railroad Business—Burlington Northern Santa Fe

Through BNSF Railway, BNSF operates approximately 32,500 route miles of track (excluding multiple main tracks, yard tracks and sidings) in 28 states, and also operates in three Canadian provinces. BNSF owns over 23,000 route miles, including easements, and operates over 9,000 route miles of trackage rights that permit BNSF to operate its trains with its crews over other railroads' tracks. As of December 31, 2020, the total BNSF Railway system, including single and multiple main tracks, yard tracks and sidings, consisted of over 50,000 operated miles of track.

BNSF operates various facilities and equipment to support its transportation system, including its infrastructure, locomotives and freight cars. It also owns or leases other equipment to support rail operations, such as vehicles. Support facilities for rail operations include yards and terminals throughout its rail network, system locomotive shops to perform locomotive servicing and maintenance, a centralized network operations center for train dispatching and network operations monitoring and management, computers, telecommunications equipment, signal systems and other support systems. Transfer facilities are maintained for rail-to-rail as well as intermodal transfer of containers, trailers and other freight traffic and include approximately 25 intermodal hubs located across the system. BNSF owns or holds under non-cancelable leases exceeding one year approximately 7,700 locomotives and 66,000 freight cars, in addition to maintenance of way and other equipment.

In the ordinary course of business, BNSF incurs significant costs in repairing and maintaining its properties. In 2020, BNSF recorded approximately $2 billion in repairs and maintenance expense.

Utilities and Energy Businesses—Berkshire Hathaway Energy

BHE's energy properties consist of the physical assets necessary to support its electricity and natural gas businesses. Properties of BHE's electricity businesses include electric generation, transmission and distribution facilities, as well as coal mining assets that support certain of BHE's electric generating facilities. Properties of BHE's natural gas businesses include natural gas distribution facilities, interstate pipelines, storage facilities, liquefied natural gas facilities, compressor stations and meter stations. The transmission and distribution assets are primarily within each of BHE's utility service territories. In addition to these physical assets, BHE has rights-of-way, mineral rights and water rights that enable BHE to utilize its facilities. Pursuant to separate financing agreements, the majority of these properties are pledged or encumbered to support or otherwise provide the security for the related subsidiary debt. BHE or its affiliates own or have interests in the following types of operating electric generating facilities at December 31, 2020:

Energy Source	Entity	Location by Significance	Facility Net Capacity (MW) (1)	Net Owned Capacity (MW) (1)
Natural gas	PacifiCorp, MEC, NV Energy and BHE Renewables	Nevada, Utah, Iowa, Illinois, Washington, Wyoming, Oregon, Texas, New York and Arizona	11,171	10,892
Wind	PacifiCorp, MEC and BHE Renewables	Iowa, Wyoming, Texas, Nebraska, Washington, California, Illinois, Oregon, Kansas and Montana	10,302	10,302
Coal	PacifiCorp, MEC and NV Energy	Wyoming, Iowa, Utah, Nevada, Colorado and Montana	13,249	8,198
Solar	BHE Renewables and NV Energy	California, Texas, Arizona, Minnesota and Nevada	1,699	1,551
Hydroelectric	PacifiCorp, MEC and BHE Renewables	Washington, Oregon, The Philippines, Idaho, California, Utah, Hawaii, Montana, Illinois and Wyoming	1,299	1,277
Nuclear	MEC	Illinois	1,815	454
Geothermal	PacifiCorp and BHE Renewables	California and Utah	377	377
		Total	39,912	33,051

(1) *Facility Net Capacity in megawatts (MW) represents the lesser of nominal ratings or any limitations under applicable interconnection, power purchase, or other agreements for intermittent resources and the total net dependable capability available during summer conditions for all other units. An intermittent resource's nominal rating is the manufacturer's contractually specified capability (in MW) under specified conditions. Net Owned Capacity indicates BHE's ownership of Facility Net Capacity.*

As of December 31, 2020, BHE's subsidiaries also have electric generating facilities that are under construction in Iowa, Wyoming and Montana having total Facility Net Capacity and Net Owned Capacity of 603 MW.

PacifiCorp, MEC and NV Energy own electric transmission and distribution systems, including approximately 27,600 miles of transmission lines and approximately 1,650 substations and gas distribution facilities, including approximately 27,600 miles of gas mains and service lines.

Northern Powergrid (Northeast) and Northern Powergrid (Yorkshire) operate an electricity distribution network that includes approximately 17,300 miles of overhead lines, approximately 42,800 miles of underground cables and approximately 770 major substations. AltaLink's electricity transmission system includes approximately 8,200 miles of transmission lines and approximately 310 substations.

The BHE GT&S pipeline system consists of approximately 5,400 miles of natural gas transmission, gathering and storage pipelines. BHE GT&S provides natural gas storage and transportation service to on-system customers in Maryland, New York, Ohio, Pennsylvania, South Carolina, Virginia and West Virginia. Additionally, through multiple interconnects with other pipelines, BHE GT&S provides services to off-system customers broadly in the Northeast, Southeast and Mid-Atlantic regions. Storage services are provided through the operation of 17 underground natural gas storage fields located in Pennsylvania, West Virginia and New York. BHE GT&S also operates, as the general partner, and owns a 25% limited partnership interest in one liquefied natural gas export, import and storage facility in Maryland and operates and has ownership interests in three modular liquefied natural gas facilities in Alabama, Florida and Pennsylvania.

Northern Natural's pipeline system consists of approximately 14,500 miles of natural gas pipelines, including approximately 6,000 miles of mainline transmission pipelines and approximately 8,500 miles of branch and lateral pipelines. Northern Natural's end-use and distribution market area includes points in Iowa, Nebraska, Minnesota, Wisconsin, South Dakota, Michigan and Illinois and its natural gas supply and delivery service area includes points in Kansas, Texas, Oklahoma and New Mexico. Storage services are provided through the operation of one underground natural gas storage field in Iowa, two underground natural gas storage facilities in Kansas and two liquefied natural gas storage peaking units, one in Iowa and one in Minnesota.

Kern River's system consists of approximately 1,400 miles of natural gas pipelines, which extends from the system's point of origination in Wyoming through the Central Rocky Mountains into California.

Other Segments

Significant physical properties used by Berkshire's other business segments are summarized below:

				Number of Properties	
Business	**Country**	**Locations**	**Property/ Facility type**	**Owned**	**Leased**
Insurance:					
GEICO	U.S.		Offices and claims centers	10	122
BHRG	U.S.		Offices	1	30
	Non-U.S.	Locations in 22 countries	Offices	1	37
BH Primary	U.S.		Offices	7	51
	Non-U.S.	Locations in 7 countries	Offices	—	16
Manufacturing	U.S.		Manufacturing facility	485	119
			Offices/ Warehouses	207	443
			Retail/ Showroom	261	213
			Housing communities	312	—
	Non-U.S.	Locations in 63 countries	Manufacturing facility	199	124
			Offices/ Warehouses	88	448
			Retail/ Showroom	—	4
Service	U.S.		Training facilities/ Hangars	19	94
			Offices/ Distribution	15	144
			Production facilities	4	3
			Leasing/ Showroom/ Retail	31	48
	Non-U.S.	Locations in 18 countries	Training facilities/ Hangars	2	12
			Offices/ Distribution	—	48

McLane Company	U.S.		Distribution centers	59	26
			Offices	4	1
Retailing	U.S.		Offices/ Warehouses	21	26
			Retail/ Showroom	142	543
	Non-U.S.	Locations in 6 countries	Offices/ Warehouses	1	9
			Retail/ Offices	—	93

Item 3. Legal Proceedings

Berkshire and its subsidiaries are parties in a variety of legal actions that routinely arise out of the normal course of business, including legal actions seeking to establish liability directly through insurance contracts or indirectly through reinsurance contracts issued by Berkshire subsidiaries. Plaintiffs occasionally seek punitive or exemplary damages. We do not believe that such normal and routine litigation will have a material effect on our financial condition or results of operations. Berkshire and certain of its subsidiaries are also involved in other kinds of legal actions, some of which assert or may assert claims or seek to impose fines and penalties. We believe that any liability that may arise as a result of other pending legal actions will not have a material effect on our consolidated financial condition or results of operations.

Item 4. Mine Safety Disclosures

Information regarding the Company's mine safety violations and other legal matters disclosed in accordance with Section 1503 (a) of the Dodd-Frank Reform Act is included in Exhibit 95 to this Form 10-K.

Executive Officers of the Registrant

Following is a list of the Registrant's named executive officers:

Name	Age	Position with Registrant	Since
Warren E. Buffett	90	Chairman and Chief Executive Officer	1970
Charles T. Munger	97	Vice Chairman	1978
Gregory E. Abel	58	Vice Chairman – Non-Insurance Operations	2018
Ajit Jain	69	Vice Chairman – Insurance Operations	2018
Marc D. Hamburg	71	Senior Vice-President – Chief Financial Officer	1992

Each executive officer serves, in accordance with the by-laws of the Registrant, until the first meeting of the Board of Directors following the next annual meeting of shareholders and until a successor is chosen and qualified or until such executive officer sooner dies, resigns, is removed or becomes disqualified.

FORWARD-LOOKING STATEMENTS

Investors are cautioned that certain statements contained in this document as well as some statements in periodic press releases and some oral statements of Berkshire officials during presentations about Berkshire or its subsidiaries are "forward-looking" statements within the meaning of the Private Securities Litigation Reform Act of 1995 (the "Act"). Forward-looking statements include statements which are predictive in nature, which depend upon or refer to future events or conditions, which include words such as "expects," "anticipates," "intends," "plans," "believes," "estimates" or similar expressions. In addition, any statements concerning future financial performance (including future revenues, earnings or growth rates), ongoing business strategies or prospects and possible future Berkshire actions, which may be provided by management, are also forward-looking statements as defined by the Act. Forward-looking statements are based on current expectations and projections about future events and are subject to risks, uncertainties and assumptions about Berkshire and its subsidiaries, economic and market factors and the industries in which we do business, among other things. These statements are not guarantees of future performance and we have no specific intention to update these statements.

Actual events and results may differ materially from those expressed or forecasted in forward-looking statements due to a number of factors. The principal risk factors that could cause our actual performance and future events and actions to differ materially from such forward-looking statements include, but are not limited to, changes in market prices of our investments in fixed maturity and equity securities, losses realized from derivative contracts, the occurrence of one or more catastrophic events, such as an earthquake, hurricane, act of terrorism or cyber attack that causes losses insured by our insurance subsidiaries and/or losses to our business operations, the frequency and severity of epidemics, pandemics or other outbreaks, including COVID-19, that negatively affect our operating results and restrict our access to borrowed funds through the capital markets at reasonable rates, changes in laws or regulations affecting our insurance, railroad, utilities and energy and finance subsidiaries, changes in federal income tax laws, and changes in general economic and market factors that affect the prices of securities or the industries in which we do business.

Part II

Item 5. Market for Registrant's Common Equity, Related Security Holder Matters and Issuer Purchases of Equity Securities

Market Information

Berkshire's Class A and Class B common stock are listed for trading on the New York Stock Exchange, trading symbols: BRK.A and BRK.B, respectively.

Shareholders

Berkshire had approximately 1,600 record holders of its Class A common stock and 18,900 record holders of its Class B common stock at February 16, 2021. Record owners included nominees holding at least 351,000 shares of Class A common stock and 1,332,000,000 shares of Class B common stock on behalf of beneficial-but-not-of-record owners.

Dividends

Berkshire has not declared a cash dividend since 1967.

Common Stock Repurchase Program

Berkshire's common stock repurchase program permits Berkshire to repurchase its Class A and Class B shares at any time that Warren Buffett, Berkshire's Chairman of the Board and Chief Executive Officer, and Charles Munger, Vice Chairman of the Board, believe that the repurchase price is below Berkshire's intrinsic value, conservatively determined. Repurchases may be in the open market or through privately negotiated transactions. Information with respect to Berkshire's Class A and Class B common stock repurchased during the fourth quarter of 2020 follows.

Period	**Total number of shares purchased**	**Average price paid per share**	**Total number of shares purchased as part of publicly announced program**	**Maximum number or value of shares that yet may be repurchased under the program**
October				
Class A common stock	1,894	$ 316,292.44	1,894	*
Class B common stock	11,097,536	$ 209.92	11,097,536	*
November				
Class A common stock	2,244	$ 341,117.06	2,244	*
Class B common stock	7,423,729	$ 219.12	7,423,729	*
December				
Class A common stock	1,787	$ 342,577.29	1,787	*
Class B common stock	12,605,335	$ 225.73	12,605,335	*

* *The program does not specify a maximum number of shares to be repurchased or obligate Berkshire to repurchase any specific dollar amount or number of Class A or Class B shares and there is no expiration date to the repurchase program. Berkshire will not repurchase its common stock if the repurchases reduce the total value of Berkshire's consolidated cash, cash equivalents and U.S. Treasury Bills holdings to less than $20 billion.*

Market for Registrant’s Common Equity, Related Security Holder Matters and Issuer Purchases of Equity Securities *(Continued)*

Stock Performance Graph

The following chart compares the subsequent value of $100 invested in Berkshire common stock on December 31, 2015 with a similar investment in the Standard & Poor’s 500 Stock Index and in the Standard & Poor’s Property – Casualty Insurance Index**.

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* *Cumulative return for the Standard & Poor’s indices based on reinvestment of dividends.*

** *It would be difficult to develop a peer group of companies similar to Berkshire. The Corporation owns subsidiaries engaged in a number of diverse business activities of which the most important is the property and casualty insurance business and, accordingly, management has used the Standard & Poor’s Property—Casualty Insurance Index for comparative purposes.*

Item 6. Selected Financial Data

Selected Financial Data for the Past Five Years

(dollars in millions except per-share data)

	2020	2019	2018	2017	2016
Revenues:					
Insurance premiums earned	$ 63,401	$ 61,078	$ 57,418	$ 60,597	$ 45,881
Sales and service revenues	127,044	134,989	133,336	130,243	123,053
Leasing revenue	5,209	5,856	5,732	2,552	2,553
Railroad, utilities and energy revenues	41,764	43,453	43,673	40,005	37,447
Interest, dividend and other investment income	8,092	9,240	7,678	6,536	6,180
Total revenues	$ 245,510	$ 254,616	$ 247,837	$ 239,933	$ 215,114
Investment and derivative gains/losses	$ 40,746	$ 72,607	$ (22,455)	$ 2,128	$ 8,304
Earnings:					
Net earnings attributable to Berkshire Hathaway (1)	$ 42,521	$ 81,417	$ 4,021	$ 44,940	$ 24,074
Net earnings per share attributable to Berkshire Hathaway shareholders (2)	$ 26,668	$ 49,828	$ 2,446	$ 27,326	$ 14,645
Year-end data:					
Total assets	$ 873,729	$ 817,729	$ 707,794	$ 702,095	$ 620,854
Notes payable and other borrowings:					
Insurance and other	41,522	37,590	34,975	40,409	42,559
Railroad, utilities and energy	75,373	65,778	62,515	62,178	59,085
Berkshire Hathaway shareholders' equity	443,164	424,791	348,703	348,296	282,070
Class A equivalent common shares outstanding, in thousands	1,544	1,625	1,641	1,645	1,644
Berkshire Hathaway shareholders' equity per outstanding Class A equivalent common share	$ 287,031	$ 261,417	$ 212,503	$ 211,750	$ 171,542

(1) *Includes after-tax investment and derivative gains/losses of $31.6 billion in 2020, $57.4 billion in 2019, $(17.7) billion in 2018, $1.4 billion in 2017 and $6.5 billion in 2016. Beginning in 2018, investment gains/losses include the changes in fair values of equity securities during the period. Previously, investment gains/losses of equity securities were recognized in earnings when securities were sold. Net earnings in 2017 includes a one-time net benefit of $29.1 billion attributable to the enactment of the Tax Cuts and Jobs Act of 2017.*

(2) *Represents net earnings per average equivalent Class A share outstanding. Net earnings per average equivalent Class B common share outstanding is equal to 1/1,500 of such amount.*

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

Results of Operations

Net earnings attributable to Berkshire Hathaway shareholders for each of the past three years are disaggregated in the table that follows. Amounts are after deducting income taxes and exclude earnings attributable to noncontrolling interests (in millions).

	2020	2019	2018
Insurance – underwriting	$ 657	$ 325	$ 1,566
Insurance – investment income	5,039	5,530	4,554
Railroad	5,161	5,481	5,219
Utilities and energy	3,091	2,840	2,621
Manufacturing, service and retailing	8,300	9,372	9,364
Investment and derivative gains/losses	31,591	57,445	(17,737)
Other*	(11,318)	424	(1,566)
Net earnings attributable to Berkshire Hathaway shareholders	$ 42,521	$ 81,417	$ 4,021

* *Includes goodwill and indefinite-lived intangible asset impairment charges of $11.0 billion in 2020, $435 million in 2019 and $3.0 billion in 2018, which includes our share of charges recorded by Kraft Heinz.*

Through our subsidiaries, we engage in a number of diverse business activities. We manage our operating businesses on an unusually decentralized basis. There are few centralized or integrated business functions. Our senior corporate management team participates in and is ultimately responsible for significant capital allocation decisions, investment activities and the selection of the Chief Executive to head each of the operating businesses. The business segment data (Note 27 to the accompanying Consolidated Financial Statements) should be read in conjunction with this discussion.

As the COVID-19 pandemic accelerated beginning in the second half of March, most of our businesses were negatively affected, with the effects to date ranging from relatively minor to severe. Revenues and earnings of most of our manufacturing, service and retailing businesses declined considerably, and in certain instances severely, in the second quarter due to closures of facilities where crowds gather, such as retail stores, restaurants and entertainment venues as well as from public travel restrictions and from closures of certain of our businesses. In each of the third and fourth quarters of 2020, several of these businesses experienced significant increases in revenues and earnings as compared to the second quarter.

Our businesses that were deemed essential continued to operate through the pandemic, including our railroad, utilities and energy, insurance and certain of our manufacturing, wholesale distribution and service businesses. In response to the effects of the pandemic, our businesses implemented various business continuity plans to protect our employees and customers. Such plans include a variety of actions, such as temporarily closing certain retail stores, manufacturing facilities and service centers of businesses that were not subject to government mandated closure. Our businesses also implemented practices to protect employees while at work. Such practices included work-from-home, staggered or reduced work schedules, increased cleaning and sanitation of workspaces, providing employee health screenings, eliminating non-essential travel and face-to-face meetings and providing general health reminders intended to lower the risk of spreading COVID-19.

We also took actions in response to the economic losses from reductions in consumer demand for products and services we offer and our temporary inability to produce goods and provide services at certain of our businesses. These actions included employee furloughs, wage and salary reductions, capital spending reductions and other actions intended to help mitigate the economic losses and preserve capital and liquidity. Certain of our businesses undertook and may continue to undertake restructuring activities to resize their operations to better fit expected customer demand. We cannot reliably predict future economic effects of the pandemic or when business activities at all of our numerous and diverse operations will normalize. Nor can we predict how these events will alter the future consumption patterns of consumers and businesses we serve.

Our insurance businesses generated after-tax earnings from underwriting of $657 million in 2020, $325 million in 2019 and $1.6 billion in 2018. In each year, we generated underwriting earnings from primary insurance and underwriting losses from reinsurance. Insurance underwriting results included after-tax losses from significant catastrophe events of approximately $750 million in 2020, $800 million in 2019 and $1.3 billion in 2018. Underwriting results in 2020 also reflected the effects of the pandemic, arising from premium reductions from the GEICO Giveback program, reduced claims frequencies for private passenger automobile insurance and increased loss estimates for certain commercial insurance and property and casualty reinsurance business.

Results of Operations *(Continued)*

After-tax earnings from insurance investment income in 2020 declined $491 million (8.9%) versus 2019, reflecting lower interest income primarily attributable to declines in interest rates on our substantial holdings of cash and U.S. Treasury Bills. After-tax earnings from insurance investment income in 2019 increased 21.4% over 2018, attributable to increases in interest and dividend income.

After-tax earnings of our railroad business decreased 5.8% in 2020 as compared to 2019. Earnings in 2020 reflected lower railroad operating revenues from lower shipping volumes, attributable to the negative effects of the COVID-19 pandemic, partly offset by lower operating costs and the effects of productivity improvements. After-tax earnings of our utilities and energy business increased 8.8% as compared to 2019. The increase reflected increased tax benefits from renewable energy and increased earnings from the real estate brokerage business. Earnings in 2020 from our manufacturing, service and retailing businesses declined 11.4% versus 2019. The effects of the COVID-19 pandemic varied among our manufacturing businesses relative to significance and duration.

Other earnings included after-tax goodwill and indefinite-lived intangible asset impairment charges of $11.0 billion in 2020, $435 million in 2019 and $3.0 billion in 2018. Such amounts included our share of impairment charges recorded by Kraft Heinz. Approximately $9.8 billion of the charges in 2020 were attributable to impairments of goodwill and identifiable intangible assets recorded in connection with Berkshire's acquisition of Precision Castparts in 2016. Other earnings in 2020 also included after-tax foreign exchange rate losses of $764 million related to non-U.S. Dollar denominated debt issued by Berkshire and its U.S.-based finance subsidiary, Berkshire Hathaway Finance Corporation ("BHFC").

After-tax earnings of our railroad business increased 5.0% in 2019 compared to 2018. Earnings in 2019 benefitted from higher rates per car/unit, a curtailment gain related to an amendment to defined benefit retirement plans and ongoing operating cost control initiatives, partly offset by lower freight volumes and incremental costs associated with the persistent flooding conditions and severe winter weather in the first half of 2019. After-tax earnings of our utilities and energy business increased 8.4% in 2019 compared to 2018.

Earnings from our manufacturing, service and retailing businesses in 2019 were relatively unchanged from 2018, reflecting mixed operating results with several of these businesses experiencing lower earnings in 2019 from a variety of factors. Revenues and pre-tax earnings in 2019 of certain of these businesses were negatively affected by the unfavorable effects of foreign currency translation attributable to a stronger U.S. Dollar, international trade tensions and U.S. trade tariffs.

Investment and derivative gains/losses in each of the three years presented included significant gains and losses on our investments in equity securities, including unrealized gains and losses from market price changes on securities we continue to hold. We believe that investment and derivative gains/losses, whether realized from dispositions or unrealized from changes in market prices of equity securities, are generally meaningless in understanding our reported results or evaluating the economic performance of our businesses. These gains and losses have caused and will continue to cause significant volatility in our periodic earnings.

Insurance—Underwriting

Our management views our insurance businesses as possessing two distinct activities – underwriting and investing. Underwriting decisions are the responsibility of the unit managers, while investing decisions are the responsibility of Berkshire's Chairman and CEO, Warren E. Buffett and Berkshire's corporate investment managers. Accordingly, we evaluate performance of underwriting operations without any allocation of investment income or investment gains/losses. We consider investment income as an integral component of our aggregate insurance operating results. However, we consider investment gains and losses, whether realized or unrealized as non-operating, based on our long-held strategy of acquiring securities and holding those securities for long periods. We believe that such gains and losses are not meaningful in understanding the operating results of our insurance businesses.

The timing and amount of catastrophe losses can produce significant volatility in our periodic underwriting results, particularly with respect to our reinsurance businesses. Generally, we consider pre-tax losses in excess of $100 million from a current year catastrophic event to be significant.

Changes in estimates for unpaid losses and loss adjustment expenses, including amounts established for occurrences in prior years, can also significantly affect our periodic underwriting results. Unpaid loss estimates, including estimates under retroactive reinsurance contracts, were approximately $120.8 billion as of December 31, 2020. Our periodic underwriting results may also include significant foreign currency transaction gains and losses arising from the changes in the valuation of non-U.S. Dollar denominated liabilities of our U.S. based insurance subsidiaries due to foreign currency exchange rate fluctuations.

Insurance—Underwriting *(Continued)*

Underwriting results in 2020 of certain of our commercial insurance and reinsurance businesses were negatively affected by estimated losses and costs associated with the COVID-19 pandemic, including estimated provisions for claims and uncollectible premiums and incremental operating costs to maintain customer service levels. The effects of the pandemic in the future may be further affected by judicial rulings and regulatory and legislative actions pertaining to insurance coverage and claims and by its effects on general economic activity, which we cannot reasonably estimate at this time.

We provide primary insurance and reinsurance products covering property and casualty risks, as well as life and health risks. Our insurance and reinsurance businesses are GEICO, Berkshire Hathaway Primary Group and Berkshire Hathaway Reinsurance Group ("BHRG").

Underwriting results of our insurance businesses are summarized below (dollars in millions).

	2020	2019	2018
Pre-tax underwriting earnings (loss):			
GEICO	$ 3,428	$ 1,506	$ 2,449
Berkshire Hathaway Primary Group	110	383	670
Berkshire Hathaway Reinsurance Group	(2,700)	(1,472)	(1,109)
Pre-tax underwriting earnings	838	417	2,010
Income taxes and noncontrolling interests	181	92	444
Net underwriting earnings	$ 657	$ 325	$ 1,566
Effective income tax rate	21.5%	24.2%	21.4%

GEICO

GEICO writes private passenger automobile insurance, offering coverages to insureds in all 50 states and the District of Columbia. GEICO markets its policies mainly by direct response methods where most customers apply for coverage directly to the company via the Internet or over the telephone. A summary of GEICO's underwriting results follows (dollars in millions).

	2020		2019		2018	
	Amount	%	Amount	%	Amount	%
Premiums written	$ 34,928		$ 36,016		$ 34,123	
Premiums earned	$ 35,093	100.0	$ 35,572	100.0	$ 33,363	100.0
Losses and loss adjustment expenses	26,018	74.1	28,937	81.3	26,278	78.8
Underwriting expenses	5,647	16.1	5,129	14.5	4,636	13.9
Total losses and expenses	31,665	90.2	34,066	95.8	30,914	92.7
Pre-tax underwriting earnings	$ 3,428		$ 1,506		$ 2,449	

2020 versus 2019

GEICO's pre-tax underwriting earnings for 2020 reflected significant declines in losses and loss adjustment expenses attributable to lower claims frequencies from the effects of less driving by policyholders during the COVID-19 pandemic offset by the effects of the GEICO Giveback program (see following paragraph) on earned premiums.

Premiums written decreased 3.0% compared to 2019. The GEICO Giveback program provided for a 15% premium credit to all voluntary auto and motorcycle policies renewing between April 8, 2020 and October 7, 2020, as well as to any new policies written during the same period. The GEICO Giveback program reduced premiums written in 2020 by approximately $2.9 billion. Premiums earned decreased 1.3% in 2020 compared to 2019, which included reductions of approximately $2.5 billion attributable to the GEICO Giveback program.

Insurance—Underwriting *(Continued)*

GEICO (Continued)

Voluntary auto policies-in-force at the end of 2020 increased approximately 820,000 (4.6%) compared to the end of 2019. The increase reflected a 7.3% decrease in new business sales and a 2.5% decrease in non-renewals and policy cancellations.

Losses and loss adjustment expenses decreased $2.9 billion (10.1%) in 2020 compared to 2019. GEICO's ratio of losses and loss adjustment expenses to premiums earned (the "loss ratio") was 74.1%, a decrease of 7.2 percentage points compared to 2019. The decrease in the loss ratio reflected declines in claims frequencies, partly offset by increases in claims severities and the impact of lower premiums earned attributable to the GEICO Giveback program.

Claims frequencies in 2020 were lower for property damage, bodily injury and personal injury protection coverages (twenty-eight to thirty percent range) and collision coverage (twenty-three to twenty-four percent range) compared to 2019. Average claims severities in 2020 were higher for property damage and collision coverages (eight to ten percent range) and bodily injury coverage (twelve to thirteen percent range).

Losses and loss adjustment expenses included net reductions of $253 million in 2020 for decreases in the ultimate loss estimates for prior years' loss events compared to net increases of $42 million in 2019. Losses incurred included $81 million in 2020 from Hurricanes Laura and Sally and U.S. wildfires. There were no losses from significant catastrophe events in 2019.

Underwriting expenses in 2020 increased $518 million (10.1%) compared to 2019, reflecting higher employee-related, advertising and technology costs partly offset by lower premium taxes. GEICO's expense ratio in 2020 (underwriting expenses to premiums earned) was 16.1%, an increase of 1.6 percentage points compared to 2019. The expense ratio increase was primarily attributable to the decline in earned premiums from the GEICO Giveback program.

2019 versus 2018

Premiums written and earned in 2019 increased 5.5% and 6.6%, respectively, compared to 2018. These increases were primarily attributable to voluntary auto policies-in-force growth of 6.4%, partially offset by a decrease in average premiums per auto policy. The increase in voluntary auto policies-in-force primarily resulted from an increase in new business sales and a decrease in policies cancelled or not renewed. Voluntary auto policies-in-force increased approximately 1,068,000 during 2019.

Losses and loss adjustment expenses in 2019 increased 10.1% compared to 2018. The loss ratio in 2019 was 81.3%, an increase of 2.5 percentage points over 2018, primarily due to increases in average claims severities.

Average claims severities in 2019 were higher versus 2018 for property damage and collision coverages (four to six percent range) and bodily injury coverage (seven to nine percent range). Claims frequencies in 2019 declined compared to 2018 for property damage and collision coverages (two to four percent range) and personal injury protection coverage (one to two percent range) and were relatively unchanged for bodily injury coverage. Losses and loss adjustment expenses included net increases of $42 million in 2019 and net of decreases $222 million in 2018 for changes in the ultimate loss estimates for prior years' loss events.

Underwriting expenses in 2019 increased $493 million (10.6%) over 2018. GEICO's underwriting expense ratio in 2019 was 14.5%, an increase of 0.6 percentage points compared to 2018. The underwriting expense increase was primarily attributable to increases in advertising expenses and employee-related costs, which reflected wage and staffing increases.

Insurance—Underwriting *(Continued)*

Berkshire Hathaway Primary Group

The Berkshire Hathaway Primary Group ("BH Primary") provides a variety of commercial insurance solutions, including healthcare malpractice, workers' compensation, automobile, general liability, property and various specialty coverages for small, medium and large clients. The largest of these insurers are Berkshire Hathaway Specialty Insurance ("BH Specialty"), Berkshire Hathaway Homestate Companies ("BHHC"), MedPro Group, Berkshire Hathaway GUARD Insurance Companies ("GUARD") and National Indemnity Company ("NICO Primary"). Other BH Primary insurers include U.S. Liability Insurance Company, Central States Indemnity Company and MLMIC Insurance Company ("MLMIC"), acquired October 1, 2018. A summary of BH Primary underwriting results follows (dollars in millions).

	2020		2019		2018	
	Amount	%	Amount	%	Amount	%
Premiums written	$ 10,212		$ 9,843		$ 8,561	
Premiums earned	$ 9,615	100.0	$ 9,165	100.0	$ 8,111	100.0
Losses and loss adjustment expenses	7,129	74.1	6,336	69.1	5,261	64.9
Underwriting expenses	2,376	24.7	2,446	26.7	2,180	26.9
Total losses and expenses	9,505	98.8	8,782	95.8	7,441	91.8
Pre-tax underwriting earnings	$ 110		$ 383		$ 670	

Premiums written increased $369 million (3.7%) in 2020 compared to 2019, reflecting increased premiums written from BH Specialty (34%) and MedPro Group (9%), partially offset by a 13% decrease in premiums written by our other primary insurers. The increase at BH Specialty was driven by increased casualty business globally and the increase at MedPro Group reflected increases across several product categories. The decline in volume by our other primary insurers was primarily due to lower workers' compensation and commercial automobile volumes and the effect of the divestiture of Applied Underwriters in October 2019. The declines in workers' compensation and commercial auto business written reflected the effects of reduced exposures and premium refunds related to the COVID-19 pandemic and volume reductions attributable to increased price competition in the market.

Premiums written increased $1.3 billion (15.0%) in 2019 compared to 2018. The increase was attributable to higher volumes from BH Specialty, MedPro Group and GUARD, as well as from the effects of the MLMIC acquisition. These increases were partly offset by lower volume at BHHC and the effect of the Applied Underwriters divestiture.

BH Primary's combined loss ratios were 74.1% in 2020, 69.1% in 2019 and 64.9% in 2018, which reflected the effects of significant catastrophe events during the year and changes in estimated losses for prior years' loss events. Losses and loss adjustment expenses attributable to significant catastrophe events were $207 million in 2020 (Hurricanes Laura and Sally and U.S. wildfires) and $190 million in 2018 (Hurricanes Florence and Michael and the wildfires in California). We incurred no losses from significant catastrophe events in 2019. Losses in 2020 also included $167 million attributable to the pandemic. Finally, losses and loss adjustment expenses were reduced $265 million in 2020, $499 million in 2019 and $715 million in 2018 for net reductions in estimated ultimate liabilities for prior years' loss events.

BH Primary insurers write significant levels of commercial and professional liability and workers' compensation insurance and the related claim costs may be subject to high severity and long claim-tails. Accordingly, we could experience significant increases in claims liabilities in the future attributable to higher-than-expected claim settlements, adverse litigation outcomes or judicial rulings and other factors not currently anticipated.

Berkshire Hathaway Reinsurance Group

We offer excess-of-loss and quota-share reinsurance coverages on property and casualty risks and life and health reinsurance to insurers and reinsurers worldwide through several subsidiaries, led by National Indemnity Company ("NICO"), Berkshire Hathaway Life Insurance Company of Nebraska ("BHLN") and General Reinsurance Corporation, General Reinsurance AG and General Re Life Corporation (collectively, "General Re"). We also periodically assume property and casualty risks under retroactive reinsurance contracts written through NICO. In addition, we write periodic payment annuity contracts predominantly through BHLN.

Insurance—Underwriting *(Continued)*

Berkshire Hathaway Reinsurance Group (Continued)

Generally, we strive to generate underwriting profits. However, time-value-of-money concepts are important elements in establishing prices for retroactive reinsurance and periodic payment annuity businesses due to the expected long durations of the liabilities. We expect to incur pre-tax underwriting losses from such businesses, primarily through deferred charge amortization and discount accretion charges. We receive premiums at the inception of these contracts, which are then available for investment. A summary of BHRG's premiums and pre-tax underwriting results follows (dollars in millions).

	Premiums written			Premiums earned			Pre-tax underwriting earnings (loss)		
	2020	2019	2018	2020	2019	2018	2020	2019	2018
Property/casualty	$13,295	$10,428	$ 9,413	$12,214	$ 9,911	$ 8,928	$ (799)	$ 16	$ (207)
Life/health	5,848	4,963	5,430	5,861	4,869	5,327	(18)	159	182
Retroactive reinsurance	38	684	517	38	684	517	(1,248)	(1,265)	(778)
Periodic payment annuity	566	863	1,156	566	863	1,156	(617)	(549)	(340)
Variable annuity	14	14	16	14	14	16	(18)	167	34
	$19,761	$16,952	$16,532	$18,693	$16,341	$15,944	$(2,700)	$(1,472)	$(1,109)

Property/casualty

A summary of property/casualty reinsurance underwriting results follows (dollars in millions).

	2020		2019		2018	
	Amount	%	Amount	%	Amount	%
Premiums written	$ 13,295		$ 10,428		$ 9,413	
Premiums earned	$ 12,214	100.0	$ 9,911	100.0	$ 8,928	100.0
Losses and loss adjustment expenses	9,898	81.0	7,313	73.8	6,929	77.6
Underwriting expenses	3,115	25.5	2,582	26.0	2,206	24.7
Total losses and expenses	13,013	106.5	9,895	99.8	9,135	102.3
Pre-tax underwriting earnings (loss)	$ (799)		$ 16		$ (207)	

Premiums written in 2020 increased $2.9 billion (27.5%) compared to 2019. The increase was primarily attributable to new business, including a small number of contracts with very large premiums, and increased participations on renewals. Premiums written in 2019 increased $1.0 billion (10.8%) compared to 2018. The increase was primarily attributable to new business, net of non-renewals, and increased participations on renewal business, partly offset by the unfavorable foreign currency translation effects of a stronger U.S. Dollar.

Underwriting earnings in 2020 were negatively affected by an increase in losses and loss adjustment expenses of $2.6 billion (35.3%). The loss ratio in 2020 was 81.0%, an increase of 7.2 percentage points over 2019. Losses and loss adjustment expenses in 2020 included estimated losses of $964 million attributable to the COVID-19 pandemic and estimated losses from significant catastrophe events of $667 million from Hurricanes Laura and Sally and U.S. wildfires. Losses and loss adjustment expenses also reflected net increases in estimated ultimate liabilities for prior years' loss events of $162 million in 2020 primarily attributable to legacy environmental, asbestos and other latent injury claims. Such amount as a percentage of the related net unpaid claim liabilities as of the beginning of 2020 was 0.5%.

BHRG's loss ratio was 73.8% in 2019 and 77.6% in 2018. Losses in 2019 included approximately $1.0 billion from Typhoons Faxia and Hagibis and various U.S. and non-U.S. wildfires, while losses in 2018 included approximately $1.3 billion from Hurricanes Florence and Michael, Typhoon Jebi and wildfires in California. Losses and loss adjustment expenses also included net decreases of $295 million in 2019 and $469 million in 2018 for prior years' loss events. Such amounts as percentages of the related net unpaid claim liabilities as of the beginning of the applicable year were 1.0% in 2019 and 1.7% in 2018.

Underwriting expenses are primarily commissions and brokerage costs. Underwriting expenses in 2020 increased $533 million (20.6%) over 2019, and underwriting expenses in 2019 increased $376 million (17.0%) over 2018. The increases reflected the increases in premium volumes and changes in business mix.

Insurance—Underwriting *(Continued)*

Life/health

A summary of our life/health reinsurance underwriting results follows (dollars in millions).

	2020		2019		2018	
	Amount	%	Amount	%	Amount	%
Premiums written	$ 5,848		$ 4,963		$ 5,430	
Premiums earned	$ 5,861	100.0	$ 4,869	100.0	$ 5,327	100.0
Life and health insurance benefits	4,883	83.3	3,800	78.0	4,240	79.6
Underwriting expenses	996	17.0	910	18.7	905	17.0
Total benefits and expenses	5,879	100.3	4,710	96.7	5,145	96.6
Pre-tax underwriting earnings (loss)	$ (18)		$ 159		$ 182	

Life/health premiums written increased $885 million (17.8%) in 2020 compared to 2019. Approximately $480 million of the increase was attributable to a reinsurance contract covering U.S. health insurance risks that incepted in the fourth quarter of 2019, which was not renewed for 2021. The remainder of the increase was primarily from volume growth in the Asian and European life reinsurance markets.

Underwriting earnings in 2020 were negatively affected by increased life benefits from COVID-19-related claims (approximately $275 million) and continuing losses from increased liabilities from changes in underlying assumptions with respect to disability benefit liabilities in Australia, which were mostly offset by lower other life claims and reduced losses from U.S. long-term care business that is in run-off. The ratio of life and health insurance benefits to premiums earned was 83.3% in 2020 and 81.5% in 2019, which is before the effects of the BHLN contract amendment referred to below.

Life/health premiums written in 2019 decreased $467 million (8.6%) compared to 2018. In the first quarter of 2019, BHLN amended a yearly-renewable-term life reinsurance contract with a major reinsurer. BHLN recorded a reduction in earned premiums on this contract in 2019 of $49 million, while premiums earned in 2018 related to this contract were $954 million. In 2019, premiums earned also included $228 million from a new health reinsurance contract and reflected volume growth in life markets, partially offset by the unfavorable effects of foreign currency translation attributable to a stronger U.S. Dollar.

Underwriting earnings in 2019 included a one-time gain of $163 million attributable to the BHLN yearly-renewable-term life reinsurance contract amendment. Pre-tax underwriting earnings in 2019 also included losses from increased disability benefit liabilities in Australia, attributable to higher claims experience and changes to various underlying assumptions increased U.S. long-term care liabilities due to discount rate reductions and changes in other actuarial assumptions, and an increase in life claims in North America, partially offset by increased earnings from other international life business.

Retroactive reinsurance

There were no significant retroactive reinsurance contracts written in 2020. Premiums written were $684 million in 2019 and $517 million in 2018, attributable to a limited number of contracts in each year. Pre-tax underwriting losses in each year derived from deferred charge amortization and changes in the estimated timing and amounts of future claim payments. Underwriting results also include foreign currency exchange gains and losses from the effects of changes in foreign currency exchange rates on non-U.S. Dollar denominated liabilities of our U.S. subsidiaries. Underwriting results included pre-tax foreign currency losses of $139 million in 2020 and $76 million in 2019 and pre-tax gains of $169 million in 2018.

Pre-tax underwriting losses before foreign currency gains/losses were $1.1 billion in 2020, $1.2 billion in 2019 and $947 million in 2018. Overall, we decreased estimated ultimate liabilities $399 million in 2020 for prior years' contracts compared to an increase of $378 million in 2019. After adjustments to the related unamortized deferred charges from changes in the estimated timing and amount of the future claim payments, such changes produced pre-tax underwriting earnings of approximately $230 million in 2020 and pre-tax losses of $125 million in 2019.

Gross unpaid losses assumed under retroactive reinsurance contracts were $41.0 billion at December 31, 2020 and $42.4 billion at December 31, 2019. Unamortized deferred charge assets related to such reinsurance contracts were $12.4 billion at December 31, 2020 and $13.7 billion at December 31, 2019. Deferred charge assets will be charged to earnings over the expected remaining claims settlement periods through periodic amortization.

Insurance—Underwriting *(Continued)*

Periodic payment annuity

Periodic payment annuity premiums earned in 2020 decreased $297 million (34.4%) compared to 2019, which decreased $293 million (25.3%) from 2018. Periodic payment annuity business is price sensitive. The volumes written can change rapidly due to changes in prices, which are affected by prevailing interest rates, the perceived risks and durations associated with the expected annuity payments, as well as the level of competition.

Periodic payment annuity contracts normally produce pre-tax underwriting losses deriving from the recurring discount accretion of annuity liabilities. Underwriting results also include gains or losses from the effects of changes in mortality and interest rates and from foreign currency exchange rate changes on non-U.S. Dollar denominated liabilities of our U.S. subsidiaries. Pre-tax underwriting results included foreign currency losses of $67 million in 2020 and $40 million in 2019 compared to pre-tax gains of $93 million in 2018.

Excluding foreign currency gains/losses, pre-tax underwriting losses from periodic payment annuity contracts were $550 million in 2020, $509 million in 2019 and $433 million in 2018. These losses primarily derived from the recurring discount accretion of annuity liabilities, as well as from the impact of mortality and interest rate changes. Discounted annuity liabilities were $14.3 billion at December 31, 2020 and $13.5 billion at December 31, 2019. The weighted average discount rate was approximately 4.0%.

Variable annuity

Variable annuity guarantee reinsurance contracts produced pre-tax losses of $18 million in 2020 compared to pre-tax earnings of $167 million in 2019 and $34 million in 2018. The results of this business reflect changes in remaining liabilities for underlying guaranteed benefits reinsured, which are affected by changes in securities markets and interest rates and from the periodic amortization of expected profit margins. Underwriting results from these contracts can be volatile, reflecting the volatility of securities markets, interest rates and foreign currency exchange rates.

Insurance—Investment Income

A summary of net investment income attributable to our insurance operations follows (dollars in millions).

				Percentage change	
	2020	**2019**	**2018**	**2020 vs 2019**	**2019 vs 2018**
Interest and other investment income	$ 1,059	$ 2,075	$ 1,851	(49.0)%	12.1%
Dividend income	4,890	4,525	3,652	8.1	23.9
Pre-tax net investment income	5,949	6,600	5,503	(9.9)	19.9
Income taxes and noncontrolling interests	910	1,070	949		
Net investment income	$ 5,039	$ 5,530	$ 4,554		
Effective income tax rate	15.3%	16.1%	17.2%		

Interest and other investment income declined $1.0 billion (49.0%) in 2020 compared to 2019, primarily due to lower income from short-term investments. We continue to hold substantial balances of cash, cash equivalents and short-term U.S. Treasury Bills. Short-term interest rates declined over the second half of 2019 and the decline continued throughout 2020, which resulted in significantly lower interest income. We expect such rates, which are historically low, to remain low, negatively affecting our earnings from such investments in 2021. Nevertheless, we believe that maintaining ample liquidity is paramount and we insist on safety over yield with respect to short-term investments.

Insurance—Investment Income *(Continued)*

Dividend income increased $365 million (8.1%) in 2020 compared to 2019. The increase was primarily attributable to dividends from the investment in $10 billion liquidation value of 8% cumulative preferred stock of Occidental Petroleum Corporation ("Occidental") on August 8, 2019, partly offset by lower dividends from common stock investments.

Interest and other investment income increased $224 million (12.1%) in 2019 compared to 2018, primarily due to higher interest rates on short-term investments and interest from a term loan with Seritage Growth Properties, partially offset by lower income earned from fixed maturity securities and limited partnership investments. Dividend income increased $873 million (23.9%) in 2019 compared to 2018. The increase in dividend income was attributable to an overall increase in investment levels, including the investment in Occidental and increased dividends from common stock investments.

Invested assets of our insurance businesses derive from shareholder capital, including reinvested earnings, and from net liabilities under insurance and reinsurance contracts or "float." The major components of float are unpaid losses and loss adjustment expenses, including liabilities under retroactive reinsurance contracts, life, annuity and health insurance benefit liabilities, unearned premiums and other liabilities due to policyholders, which are reduced by insurance premiums and reinsurance receivables, deferred charges assumed under retroactive reinsurance contracts and deferred policy acquisition costs. Float approximated $138 billion at December 31, 2020, $129 billion at December 31, 2019 and $123 billion at December 31, 2018. Our combined insurance operations generated pre-tax underwriting earnings of approximately $838 million in 2020, $417 million in 2019 and $2.0 billion in 2018, and consequently, the average cost of float for each of those periods was negative.

A summary of cash and investments held in our insurance businesses as of December 31, 2020 and 2019 follows (in millions).

	December 31, 2020	December 31, 2019
Cash, cash equivalents and U.S. Treasury Bills	$ 67,082	$ 64,908
Equity securities	269,498	240,126
Fixed maturity securities	20,317	18,537
Other	6,220	2,481
	$ 363,117	$ 326,052

Fixed maturity investments as of December 31, 2020 were as follows (in millions).

	Amortized cost	Unrealized gains/losses	Carrying value
U.S. Treasury, U.S. government corporations and agencies	$ 3,339	$ 55	$ 3,394
Foreign governments	11,232	105	11,337
Corporate bonds	4,678	462	5,140
Other	382	64	446
	$ 19,631	$ 686	$ 20,317

U.S. government obligations are rated AA+ or Aaa by the major rating agencies. Approximately 88% of all foreign government obligations were rated AA or higher by at least one of the major rating agencies. Foreign government securities include obligations issued or unconditionally guaranteed by national or provincial government entities.

Railroad ("Burlington Northern Santa Fe")

Burlington Northern Santa Fe, LLC ("BNSF") operates one of the largest railroad systems in North America, with approximately 32,500 route miles of track in 28 states. BNSF also operates in three Canadian provinces. BNSF classifies its major railroad business groups by type of product shipped which includes consumer products, industrial products, agricultural products and coal. A summary of BNSF's earnings follows (dollars in millions).

				Percentage change	
	2020	**2019**	**2018**	**2020 vs 2019**	**2019 vs 2018**
Railroad operating revenues	$ 20,181	$ 22,745	$ 22,999	(11.3)%	(1.1)%
Railroad operating expenses:					
Compensation and benefits	4,542	5,270	5,322	(13.8)	(1.0)
Fuel	1,789	2,944	3,346	(39.2)	(12.0)
Purchased services	1,954	2,049	2,131	(4.6)	(3.8)
Depreciation and amortization	2,460	2,389	2,306	3.0	3.6
Equipment rents, materials and other	1,684	2,028	2,110	(17.0)	(3.9)
Total	12,429	14,680	15,215	(15.3)	(3.5)
Railroad operating earnings	7,752	8,065	7,784	(3.9)	3.6
Other revenues (expenses):					
Other revenues	688	770	856	(10.6)	(10.0)
Other expenses, net	(611)	(515)	(736)	18.6	(30.0)
Interest expense	(1,037)	(1,070)	(1,041)	(3.1)	2.8
Pre-tax earnings	6,792	7,250	6,863	(6.3)	5.6
Income taxes	1,631	1,769	1,644	(7.8)	7.6
Net earnings	$ 5,161	$ 5,481	$ 5,219	(5.8)	5.0
Effective income tax rate	24.0%	24.4%	24.0%		

The following table summarizes BNSF's railroad freight volumes by business group (cars/units in thousands).

	Cars/Units			Percentage change	
	2020	**2019**	**2018**	**2020 vs 2019**	**2019 vs 2018**
Consumer products	5,266	5,342	5,597	(1.4)%	(4.6)%
Industrial products	1,622	1,931	1,991	(16.0)	(3.0)
Agricultural products	1,189	1,146	1,208	3.8	(5.1)
Coal	1,404	1,802	1,902	(22.1)	(5.3)
Total cars/units	9,481	10,221	10,698	(7.2)	(4.5)

2020 versus 2019

Railroad operating revenues declined 11.3% in 2020 versus 2019, reflecting a 7.2% decrease in volume and a 4.5% decrease in average revenue per car/unit. The decrease in revenue per car/unit was attributable to lower fuel surcharge revenue driven by lower fuel prices and business mix changes. The overall volume decrease was primarily due to the COVID-19 pandemic, which severely impacted volumes through the first half of the year. Volumes sequentially improved from earlier periods and recovered overall to pre-pandemic levels by the end of the year.

BNSF is an important component of the national and global supply chain and, as an essential business, has continued to operate throughout the duration of the COVID-19 pandemic. However, the pandemic caused significant economic disruptions that adversely affected the demand for transportation services. The pandemic continues to evolve, and the full extent to which it may impact BNSF's business, operating results, financial condition, or liquidity will depend on future developments. We believe BNSF's fundamental business remains strong and it has ample liquidity to continue business operations during this volatile period.

Railroad ("Burlington Northern Santa Fe") *(Continued)*

Pre-tax earnings were $6.8 billion in 2020, a decrease of 6.3% from 2019, principally due to the negative impacts of the pandemic on volumes. In addition, pre-tax earnings in 2019 included an operating revenue increase related to the favorable outcome of an arbitration hearing and a retirement plan curtailment gain that is included in other expenses, net in the preceding table. These effects were partially offset by significant improvements in 2020 in service, system velocity and cost performance compared to 2019, along with lower costs related to severe winter weather and flooding on parts of the network, which negatively affected expenses and service levels in 2019.

Operating revenues from consumer products of $7.3 billion in 2020 declined 7.6% compared to 2019, primarily due to a 6.3% decrease in average revenue per car/unit along with lower volumes. The volume decrease was primarily due to the impact of the pandemic. Lower international and automotive volumes were offset by higher domestic intermodal volumes. Increased retail sales, inventory replenishments by retailers and e-commerce activity produced recovery of intermodal volumes in the second half of 2020.

Operating revenues from industrial products were $5.0 billion in 2020, a decrease of 17.0% from 2019. The decrease was primarily attributable to the decline in volume and to a lesser extent lower average revenue per car/unit. Volumes decreased primarily due to lower U.S. industrial production driven by the pandemic, including reduced production and demand in the energy sector, which drove lower sand and petroleum products volume, along with reduced steel demand, which drove lower taconite volume.

Operating revenues from agricultural products increased 2.9% to $4.8 billion in 2020 compared to 2019. The increase was due to higher volumes, partially offset by slightly lower average revenue per car/unit. The volume increase was primarily due to higher grain and meal exports, partially offsetting adverse impacts of the pandemic, primarily for ethanol and sweeteners shipments.

Operating revenues from coal decreased 28.5% to $2.7 billion in 2020 compared to 2019. This decrease was primarily due to lower volumes, as well as lower revenues per car/unit. Volumes decreased primarily due to lower natural gas prices, lower electricity demand driven by the pandemic, utility coal plant retirements and mild temperatures.

Railroad operating expenses declined 15.3% to $12.4 billion in 2020 as compared to 2019. The ratio of railroad operating expenses to railroad operating revenues declined 2.9 percentage points to 61.6% in 2020 versus 2019. Railroad operating expenses in 2020 reflected lower volume-related costs, productivity improvements, the effects of cost control initiatives and improved weather conditions compared to 2019.

Compensation and benefits expenses decreased $728 million (13.8%) in 2020 compared to 2019, primarily due to lower employee counts associated with lower volume and due to improved workforce productivity. Fuel expenses decreased $1.2 billion (39.2%) compared to 2019, primarily due to lower average fuel prices, lower volumes and improved fuel efficiency. Purchased services expense declined $95 million (4.6%) compared to 2019. The decrease was primarily due to lower volume, improved productivity and higher insurance recoveries in 2020 related to network flooding in 2019. Equipment rents, materials and other expense decreased $344 million (17.0%) compared to 2019, primarily due to lower volume-related costs, the effects of cost controls and lower personal injury and derailment expenses.

2019 versus 2018

Railroad operating revenues were $22.7 billion in 2019, a decline of 1.1% versus 2018. During 2019, BNSF's revenues reflected a 3.6% comparative increase in average revenue per car/unit and a 4.5% decrease in volume. The increase in average revenue per car/unit was attributable to increased rates per car/unit and a favorable outcome of an arbitration hearing. Pre-tax earnings were approximately $7.3 billion in 2019, an increase of 5.6% over 2018. BNSF experienced severe winter weather and flooding on parts of the network, which negatively affected revenues, expenses and service levels. In addition to the impact of an increase in average revenue per car/unit, earnings in 2019 benefited from a reduction in total operating expenses.

Railroad ("Burlington Northern Santa Fe") *(Continued)*

Operating revenues from consumer products were $7.9 billion in 2019, a decrease of 0.5% compared to 2018, reflecting volume decreases and higher average revenue per car/unit. The volume decreases were driven by moderated demand and the availability of truck capacity, as well as lower west coast imports.

Operating revenues from industrial products were $6.1 billion in 2019, an increase of 1.7% from 2018. The increase was attributable to higher average revenue per car/unit, partially offset by a decrease in volume. Volumes decreased primarily due to overall softness in the industrial sector, lower sand volumes and reduced car loadings, due to the challenging weather conditions in 2019. Increased demand for petroleum products and liquefied petroleum gas, partially offset the other decreases in volumes.

Operating revenues from agricultural products decreased 0.3% in 2019 to $4.7 billion compared to 2018. The decrease was due to lower volumes and higher average revenue per car/unit. The volume decreases were attributable to export competition from non-U.S. sources, the impacts of international trade policies and the challenging weather conditions in 2019.

Operating revenues from coal decreased 7.4% in 2019 to $3.7 billion compared to 2018, reflecting lower average revenue per car/unit and lower volumes. Volumes were negatively impacted by adverse weather conditions, as well as from the effects of lower natural gas prices.

Railroad operating expenses were $14.7 billion in 2019, a decrease of $535 million compared to 2018. Our ratio of operating expenses to railroad operating revenues in 2019 of 64.5% decreased 1.7 percentage points versus 2018. Operating expenses in 2019 reflected lower volume-related costs, lower fuel prices and the effects of cost control initiatives, partially offset by the costs associated with the adverse weather conditions.

Fuel expenses decreased $402 million in 2019 compared to 2018, primarily due to lower average fuel prices, lower volumes and improved fuel efficiency. Purchased services expense decreased $82 million compared to 2018. The decrease was due to lower purchased transportation costs of our logistics services business, lower drayage, lower services expense and higher insurance recoveries. Equipment rents, materials and other expense decreased $82 million compared to 2018, due to lower locomotive and various other costs associated with lower volumes and cost controls. Other expenses, net decreased $221 million compared to 2018. In 2019, other expenses were net of a $120 million curtailment gain from an amendment to the company-sponsored defined benefit retirement plans.

Utilities and Energy ("Berkshire Hathaway Energy Company")

We currently own 91.1% of the outstanding common stock of Berkshire Hathaway Energy Company ("BHE"), which operates a global energy business. BHE's domestic regulated utility interests are comprised of PacifiCorp, MidAmerican Energy Company ("MEC") and NV Energy. In Great Britain, BHE subsidiaries operate two regulated electricity distribution businesses referred to as Northern Powergrid. BHE's natural gas pipelines consist of five domestic regulated interstate natural gas pipeline systems and a 25% interest in a liquefied natural gas export, import and storage facility in which BHE operates and consolidates for financial reporting purposes. Three of these systems were acquired on November 1, 2020 from Dominion Energy, Inc. ("BHE GT&S acquisition"). See Note 2 to accompanying Consolidated Financial Statements. Other energy businesses include a regulated electricity transmission-only business in Alberta, Canada ("AltaLink, L.P.") and a diversified portfolio of mostly renewable independent power projects. BHE also operates the largest residential real estate brokerage firm and one of the largest residential real estate brokerage franchise networks in the United States.

Utilities and Energy ("Berkshire Hathaway Energy Company") *(Continued)*

The rates our regulated businesses charge customers for energy and services are based in large part on the costs of business operations, including income taxes and a return on capital, and are subject to regulatory approval. To the extent such costs are not allowed in the approved rates, operating results will be adversely affected. A summary of BHE's net earnings follows (dollars in millions).

	2020	2019	2018
Revenues:			
Energy operating revenue	$ 15,556	$ 15,371	$ 15,573
Real estate operating revenue	5,396	4,473	4,214
Other income (loss)	79	270	200
Total revenue	21,031	20,114	19,987
Costs and expense:			
Energy cost of sales	4,187	4,586	4,769
Energy operating expense	7,539	6,824	6,969
Real estate operating costs and expense	4,885	4,251	4,000
Interest expense	1,941	1,835	1,777
Total costs and expense	18,552	17,496	17,515
Pre-tax earnings	2,479	2,618	2,472
Income tax expense (benefit)*	(1,010)	(526)	(452)
Net earnings after income taxes	3,489	3,144	2,924
Noncontrolling interests	71	18	23
Net earnings attributable to BHE	3,418	3,126	2,901
Noncontrolling interests and preferred stock dividends	327	286	280
Net earnings attributable to Berkshire Hathaway shareholders	$ 3,091	$ 2,840	$ 2,621
Effective income tax rate	(40.7)%	(20.1)%	(18.3)%

* *Includes significant production tax credits from wind-powered electricity generation.*

The discussion of BHE's operating results that follows is based on after-tax earnings, reflecting how the energy businesses are managed and evaluated. A summary of net earnings attributable to BHE follows (dollars in millions).

				Percentage change	
	2020	2019	2018	2020 vs 2019	2019 vs 2018
PacifiCorp	$ 741	$ 773	$ 739	(4.1)%	4.6%
MidAmerican Energy Company	818	781	669	4.7	16.7
NV Energy	410	365	317	12.3	15.1
Northern Powergrid	201	256	239	(21.5)	7.1
Natural gas pipelines	528	422	387	25.1	9.0
Other energy businesses	697	608	489	14.6	24.3
Real estate brokerage	375	160	145	134.4	10.3
Corporate interest and other	(352)	(239)	(84)	47.3	184.5
	$ 3,418	$ 3,126	$ 2,901	9.3	7.8

Utilities and Energy ("Berkshire Hathaway Energy Company") *(Continued)*

2020 versus 2019

PacifiCorp operates a regulated electric utility in portions of several Western states, including Utah, Oregon and Wyoming. PacifiCorp after-tax earnings decreased $32 million in 2020 compared to 2019. The decrease reflected higher operating expenses and net interest expense, partially offset by increased production tax credit benefits driven by repowered wind projects placed in-service, higher utility margin (operating revenue less cost of sales) and higher other income. The increase in operating expenses was largely due to costs associated with wildfires, a settlement agreement and pension benefits.

PacifiCorp utility margin was $3.3 billion in 2020, an increase of $47 million compared to 2019. The increase reflected higher operating revenue from favorable average retail prices and lower generation and purchased power costs, partially offset by lower operating revenue from a 1.4% decline in retail customer volumes. The decline in retail customer volumes was due to the impacts of the pandemic, partly offset by an increase in the average number of customers and the favorable impacts of weather.

MEC operates a regulated electric and natural gas utility primarily in Iowa and Illinois. After-tax earnings increased $37 million in 2020 compared to 2019. The increase reflected increased income tax benefits, primarily from production tax credits, driven by repowered and new wind projects placed in-service, and the effects of ratemaking. These effects were partially offset by higher depreciation expense from additional assets placed in-service, higher net interest expense, lower other income and lower electric and natural gas utility margins.

MEC electric utility margin decreased $10 million to $1.8 billion in 2020 compared to 2019. The electric utility margin decrease was attributable to lower operating revenue from unfavorable wholesale prices and price impacts from changes in retail sales mix. These effects were mostly offset by lower generation and purchased power costs and higher operating revenue from a 1.2% increase in retail customer volumes. The increase in electric retail customer volumes was primarily due to increased usage by certain industrial customers, partially offset by the impacts of the pandemic. Natural gas utility margin decreased $9 million in 2020 compared to 2019, due to the unfavorable impacts of weather.

NV Energy operates regulated electric and natural gas utilities in Nevada. After-tax earnings increased $45 million in 2020 compared to 2019. The increase reflected higher electric utility margin and lower income tax expense from the favorable impacts of ratemaking, partially offset by higher operating expenses. The increase in operating expenses was mainly due to higher earnings sharing accruals for customers at Nevada Power Company and higher depreciation expense from additional assets placed in-service.

NV Energy electric utility margin increased $100 million to $1.7 billion in 2020 compared to 2019. The increase was primarily due to higher operating revenue from a 1.5% increase in electric retail customer volumes, including distribution-only service customers and price impacts from changes in retail sales mix. The increase in electric retail customer volumes was primarily due to the favorable impacts of weather, partially offset by the impacts of the pandemic.

Northern Powergrid after-tax earnings decreased $55 million in 2020 as compared to 2019. The earnings decrease reflected write-offs of gas exploration costs and higher income tax expense, in large part from a change in the United Kingdom corporate income tax rate, partially offset by lower pension costs and interest expense.

Natural gas pipelines after-tax earnings increased $106 million in 2020 compared to 2019. The increase was primarily due to $73 million of earnings from the BHE GT&S acquisition, the favorable impact of a rate case settlement at Northern Natural Gas and higher transportation volume and rates, partially offset by higher depreciation, operating expenses and interest expenses.

Other energy business after-tax earnings in 2020 increased $89 million compared to 2019. The increase was primarily due to increased income tax benefits from renewable wind tax equity investments, largely from projects reaching commercial operation, partially offset by lower operating revenue and higher operating expenses from geothermal and natural gas units.

Utilities and Energy ("Berkshire Hathaway Energy Company") *(Continued)*

Real estate brokerage after-tax earnings increased $215 million in 2020 compared to 2019. The increase reflected higher earnings from mortgage and brokerage services. The increase in earnings from mortgage services was attributable to higher refinance activity from the favorable interest rate environment and the earnings increase from brokerage services was due to an increase of 13.1% in closed transaction dollar volume.

Corporate interest and other after-tax earnings decreased $113 million in 2020 compared to 2019. The decline was primarily due to higher interest expense and lower state income tax benefits.

2019 versus 2018

PacifiCorp after-tax earnings were $773 million in 2019, an increase of $34 million compared to 2018, reflecting slightly higher utility margin and higher other income, partly offset by higher depreciation expense from additional assets placed in-service. PacifiCorp utility margin was $3.3 billion in 2019, an increase of $4 million compared to 2018, as a 0.4% increase in retail customer volumes was largely offset by lower wholesale revenue mainly due to lower volumes.

MEC after-tax earnings of $781 million in 2019 increased $112 million as compared to 2018, primarily attributable to increases in electric utility margin, income tax benefits from higher production tax credits and the effects of ratemaking and other income. Electric utility margin in 2019 increased 2% to $1.8 billion, primarily due to higher wind generation and higher retail customer volumes of 1.4%, as a 4.0% increase in industrial volumes was largely offset by lower residential volumes from the unfavorable impacts of weather. These earnings increases were partially offset by increased depreciation expense from additional assets placed in-service (net of lower Iowa revenue sharing) and higher net interest expense.

NV Energy after-tax earnings were $365 million in 2019, an increase of $48 million compared to 2018, as lower operating expenses were partly offset by lower electric utility margin. Electric utility margin in 2019 was $1.6 billion, representing a decrease of $58 million (3%) versus 2018. The decrease was primarily due to a 1.4% decline in retail customer volumes, largely attributable to the impacts of weather, and rate reductions from the impact of the changes in U.S. income tax laws, partially offset by retail customer growth.

Northern Powergrid after-tax earnings increased in 2019 compared to 2018, reflecting higher distribution revenues and lower operating expenses, which were largely from lower pension settlement losses in 2019, partially offset by the unfavorable foreign currency translation effects of a strong average U.S. Dollar. Distribution revenues increased $18 million, attributable to higher tariff rates, partly offset by lower distributed units.

Natural gas pipelines after-tax earnings increased $35 million in 2019 compared to 2018, primarily due to higher transportation revenues from generally higher volumes and rates, favorable margins from system balancing activities and a decrease in operating expenses, partly offset by higher depreciation expense from increased spending on capital projects.

Other energy businesses after-tax earnings in 2019 increased $119 million compared to 2018. The increase was primarily due to improved earnings from renewable wind energy projects ($49 million from tax equity investments and $25 million from new and existing projects and activities), higher income from geothermal and natural gas units, largely due to higher generation and favorable margins and lower operating expenses, partly offset by lower earnings at a hydroelectric facility in the Philippines due to lower rainfall. The increase in earnings also reflected the effects of favorable regulatory decisions received in 2019 and the unfavorable impacts of a regulatory rate order received in 2018 at AltaLink L.P.

Real estate brokerage after-tax earnings increased in 2019 compared to 2018. The increase was primarily due to higher earnings at mortgage businesses due to increased refinance activity and earnings attributable to recent business acquisitions, partially offset by lower earnings at brokerage businesses, primarily from a decrease in closed units and lower margins.

Corporate interest and other after-tax earnings decreased $155 million in 2019 compared to 2018. The earnings decline was primarily due to income tax benefits recognized in 2018 related to the reduction of accrued repatriation taxes on undistributed foreign earnings in connection with the changes in U.S. income tax laws, higher interest expense and lower earnings from non-regulated energy services.

Manufacturing, Service and Retailing

A summary of revenues and earnings of our manufacturing, service and retailing businesses follows (dollars in millions).

	2020	2019	2018	Percentage change 2020 vs 2019	Percentage change 2019 vs 2018
Revenues					
Manufacturing	$ 59,079	$ 62,730	$ 61,883	(5.8)%	1.4%
Service and retailing	75,018	79,945	78,926	(6.2)	1.3
	$ 134,097	$ 142,675	$ 140,809	(6.0)	1.3
Pre-tax earnings *					
Manufacturing	$ 8,010	$ 9,522	$ 9,366	(15.9)%	1.7%
Service and retailing	2,879	2,843	2,942	1.3	(3.4)
	10,889	12,365	12,308	(11.9)	0.5
Income taxes and noncontrolling interests	2,589	2,993	2,944		
	$ 8,300	$ 9,372	$ 9,364		
Effective income tax rate	23.3%	23.7%	23.4%		
Pretax earnings as a percentage of revenues	8.1%	8.7%	8.7%		

* *Excludes certain acquisition accounting expenses, which primarily related to the amortization of identified intangible assets recorded in connection with our business acquisitions. The after-tax acquisition accounting expenses excluded from earnings above were $783 million in 2020, $788 million in 2019 and $932 million in 2018. In 2020, such expenses also exclude after-tax goodwill and indefinite-lived intangible asset impairment charges of $10.4 billion. These expenses are included in "Other" in the summary of earnings on page K-33 and in the "Other" earnings section on page K-56.*

Manufacturing

Our manufacturing group includes a variety of industrial, building and consumer products businesses. A summary of revenues and pre-tax earnings of our manufacturing operations follows (dollars in millions).

	2020	2019	2018	Percentage change 2020 vs 2019	Percentage change 2019 vs 2018
Revenues					
Industrial products	$ 25,667	$ 30,594	$ 30,679	(16.1)%	(0.3)%
Building products	21,244	20,327	18,677	4.5	8.8
Consumer products	12,168	11,809	12,527	3.0	(5.7)
	$ 59,079	$ 62,730	$ 61,883		
Pretax earnings					
Industrial products	$ 3,755	$ 5,635	$ 5,822	(33.4)%	(3.2)%
Building products	2,858	2,636	2,336	8.4	12.8
Consumer products	1,397	1,251	1,208	11.7	3.6
	$ 8,010	$ 9,522	$ 9,366		
Pre-tax earnings as a percentage of revenues					
Industrial products	14.6%	18.4%	19.0%		
Building products	13.5%	13.0%	12.5%		
Consumer products	11.5%	10.6%	9.6%		

Manufacturing, Service and Retailing *(Continued)*

Industrial products

The industrial products group includes specialty chemicals (The Lubrizol Corporation ("Lubrizol")), complex metal products for aerospace, power and general industrial markets (Precision Castparts Corp. ("PCC")), metal cutting tools/systems (IMC International Metalworking Companies ("IMC")), equipment and systems for the livestock and agricultural industries (CTB International ("CTB")), and a variety of industrial products for diverse markets (Marmon, Scott Fetzer and LiquidPower Specialty Products ("LSPI")). Marmon consists of more than 100 autonomous manufacturing and service businesses, including equipment leasing for the rail, intermodal tank container and mobile crane industries.

2020 versus 2019

Revenues of the industrial products group in 2020 declined $4.9 billion (16.1%) from 2019, while pre-tax earnings declined $1.9 billion (33.4%). Pre-tax earnings as a percentage of revenues for the group were 14.6% in 2020 compared to 18.4% in 2019.

PCC's revenues were $7.3 billion in 2020, a decrease of $3.0 billion (28.9%) compared to 2019. Historically, a significant portion of PCC's earnings have been dependent on sales related to the aerospace industry. The COVID-19 pandemic contributed to material declines in commercial air travel and aircraft production. Airlines responded to the pandemic by delaying delivery of aircraft orders or, in some cases, cancelling aircraft orders, resulting in significant reductions in build rates by aircraft manufacturers and significant inventory reduction initiatives by PCC's customers. Further, Boeing's 737 MAX aircraft production issues contributed to the declines in aerospace product sales across the industry in 2020. These factors resulted in significant declines in demand for PCC's aerospace products in 2020. In 2020, PCC's sales of products for power markets increased 2.2%, primarily driven by increases in industrial gas turbine products, offset by reductions in oil and gas products.

PCC's pre-tax earnings in 2020 were $650 million, a decrease of 64.5% compared to 2019, which reflected the decline in aerospace product sales as well as increased manufacturing inefficiencies attributable to lower volumes. In response to the effects of the pandemic, PCC has taken aggressive restructuring actions to resize operations in response to reduced expected volumes in aerospace markets. PCC's worldwide workforce was reduced by about 40% since the end of 2019. PCC recorded charges for restructuring and inventory and fixed asset charges of approximately $295 million in 2020. Although earnings as a percentage of revenues were negatively impacted in 2020 due to inefficiencies associated with aligning operations to reduced aircraft build rates, the restructuring actions taken contributed to improved margins in the fourth quarter compared to earlier in the year and further margin improvements are expected in the future. The level of aircraft production is currently expected to slowly increase beginning in the latter half of 2021. However, this is dependent of the timing and extent that COVID-19 infections are lowered on a sustained basis and the return to historical levels of air travel and subsequent demand for aerospace products.

Lubrizol's revenues were $5.95 billion in 2020, a decrease of 8.0% compared to 2019. The decline was primarily attributable to lower volumes from economic effects of the pandemic and a fire at an Additives manufacturing, blending and storage facility in Rouen, France at the end of the third quarter of 2019, which resulted in the temporary suspension of operations. Revenues in 2020 also reflected lower selling prices, partly offset by favorable changes in sales mix. Lubrizol's consolidated volume for the year declined 9% in 2020 compared to 2019, due to declines in the Additives and Engineered Materials product lines, partly offset by higher volumes in Life Science products. Overall, the effects of the pandemic on Lubrizol were more pronounced in the first half of the year, as volumes rebounded significantly in the second half.

Lubrizol's pre-tax earnings in 2020 were approximately $1.0 billion, essentially unchanged compared to 2019. The effects of lower sales volumes, including the effects from the Rouen fire and lower average selling prices were offset by lower average raw material costs, lower operating expenses and insurance recoveries in 2020 associated with the Rouen fire.

Marmon's revenues were $7.6 billion in 2020, a decrease of $681 million (8.2%) compared to 2019. Excluding the effects of business acquisitions, revenues decreased in essentially all sectors, primarily attributable to lower demand from the effects of the pandemic. The largest effects were experienced in the Transportation Products and Foodservice Technologies sectors. Additionally, revenues decreased due to lower metal prices in the Metal Services sector and the effect of business divestitures in 2019. Declines in oil prices in 2020 also adversely affected demand and revenues in the Rail & Leasing and Crane Services sectors.

Marmon's pre-tax earnings in 2020 decreased $312 million (24.3%) as compared to 2019. The decrease reflected the declines in revenues, increased restructuring charges and lower interest income. Restructuring initiatives were initiated in response to the lower product demand, particularly in the sectors most impacted by the pandemic.

Manufacturing, Service and Retailing *(Continued)*

Industrial products (Continued)

IMC's revenues declined 13.2% in 2020 compared to 2019, reflecting negative economic effects from the pandemic on demand for cutting tools in most geographic regions, partly offset by the effects of business acquisitions over the past year. IMC's pre-tax earnings declined 26.6% in 2020 versus 2019, attributable to declines in sales and margins due to lower volumes and to changes in sales mix.

2019 versus 2018

Revenues of the industrial products group were slightly lower in 2019 than in 2018 and pre-tax earnings declined 3.2% compared to 2018. Pre-tax earnings as a percentage of revenues for the group were 18.4% in 2019 compared to 19.0% in 2018.

PCC's revenues were $10.3 billion in 2019, an increase of $74 million (0.7%) compared to 2018. In 2019, PCC generated increased sales in aerospace markets, which was partially offset by lower sales in the power markets. The increase in aerospace sales was tempered due to significant efforts focused on the ramp-up requirements for certain new aerospace programs, such as LEAP, that created manufacturing inefficiencies and slowed production cycles contributing to delays in product deliveries and sales.

PCC's pre-tax earnings increased 5.1% in 2019 compared to 2018, reflecting increased sales of aerospace products and higher earnings from various non-recurring items in 2019, which were partially offset by lower earnings from the power markets due to the decrease in sales. Temporary unplanned shutdowns of certain metals facilities and metal press outages also negatively impacted earnings in 2018. PCC incurred incremental costs in 2019 to meet required deliveries to customers associated with the increased aerospace demand, which negatively affected margins and earnings. The production headwinds experienced were primarily attributable to shortages of qualified skilled labor and the rapid increase in requirements for newer, complex aerospace products.

Lubrizol's revenues were $6.5 billion in 2019, a decrease of 5.2% compared to 2018. The decline reflected lower volumes, including the effects from the Rouen fire, and unfavorable foreign currency translation effects, partly offset by higher average selling prices which were necessitated by raw material cost increases. Lubrizol's consolidated volume in 2019 declined 4% from 2018, primarily due to volume decline of 6% in the Additives product lines.

Lubrizol's pre-tax earnings in 2019 for the fourth quarter and year decreased 50.5% and 14.6%, respectively, compared to the same periods in 2018. Earnings in 2019 were significantly impacted by costs and lost business associated with the Rouen fire. Lubrizol's operating results in 2019 were also negatively affected by lower sales volumes, higher manufacturing expenses and unfavorable foreign currency translation effects, partly offset by improved material margins.

Marmon's revenues were $8.3 billion in 2019, an increase of $146 million (1.8%) compared to 2018. The revenue increase reflected the effects of business acquisitions, higher volumes in several business sectors, which were largely offset by lower distribution volumes in the Metals Services sector, unfavorable foreign currency translation and the impact of lower metal prices in the Electrical and Plumbing & Refrigeration sectors. Marmon's business acquisitions included the acquisition of the Colson Medical companies on October 31, 2019, resulting in a new Medical sector. Marmon's Rail & Leasing and Crane Services sectors benefitted from higher railcar equipment sales, railcar fleet utilization, railcar repair services, intermodal container leasing revenue and improved crane rental demand in the U.S. and Australia.

Marmon's pre-tax earnings increased $12 million in 2019 (1.0%) as compared to 2018. The earnings increase reflected the effects of business acquisitions, partly offset by lower gains from business divestitures. Earnings in 2019 also reflected increased earnings in sectors that experienced sales volume increases, which were substantially offset by lower earnings in the Metal Services and certain other sectors, the unfavorable impacts of foreign currency translation and increased interest and other expenses.

IMC's revenues declined 1.3% in 2019 as compared to 2018, reflecting unfavorable foreign currency translation effects of a stronger U.S. Dollar and lower sales in several regions, including Asia and Europe, mostly offset by increased revenues from recent business acquisitions. IMC's pre-tax earnings declined 12.8% in 2019 versus 2018, attributable to unfavorable foreign currency translation effects, changes in business mix to lower margin items and the effects of the U.S./China trade disputes.

Manufacturing, Service and Retailing *(Continued)*

Building products

The building products group includes manufactured and site-built home construction and related lending and financial services (Clayton Homes), flooring (Shaw), insulation, roofing and engineered products (Johns Manville), bricks and masonry products (Acme Building Brands), paint and coatings (Benjamin Moore), and residential and commercial construction and engineering products and systems (MiTek).

2020 versus 2019

Revenues of the building products group increased $917 million (4.5%) in 2020 compared to 2019 and pre-tax earnings increased $222 million (8.4%) over 2019. Pre-tax earnings as percentages of revenues were 13.5% in 2020 and 13.0% in 2019.

Clayton Homes' revenues were approximately $8.6 billion in 2020, an increase of $1.3 billion (17.1%) over 2019. The increase was primarily due to increases in home sales of $1.0 billion (18.4%), driven by increases in units sold and revenue per home sold and by changes in sales mix. Unit sales of site-built homes increased 28.6% in 2020 over 2019, while revenue per home increased slightly. Manufactured home unit sales increased 2.8% in 2020. Financial services revenues, which include mortgage services, insurance and interest income from lending activities increased 13.7% in 2020 compared to 2019, attributable to increased loan originations and average outstanding loan balances. Loan balances, net of allowances for credit losses, were approximately $17.1 billion at December 31, 2020 compared to $15.9 billion as of December 31, 2019.

Pre-tax earnings of Clayton Homes were approximately $1.25 billion in 2020, an increase of $152 million (13.9%) compared to 2019. The earnings increase reflected higher earnings from home sales, partly offset by higher materials costs, which lowered manufactured housing gross margin rates. Earnings in 2020 also benefitted from increased interest income, lower interest expense and higher earnings from mortgage services, partly offset by increased provisions for credit and insurance losses.

Aggregate revenues of our other building products businesses were approximately $12.6 billion in 2020, a decrease of 2.6% versus 2019. The revenue decrease reflected lower flooring volumes, partly attributable to the negative effects of the COVID-19 pandemic, partly offset by increased paint and coatings volumes, including volumes from a new agreement with Ace Hardware Stores, and increased volumes in residential markets.

Pre-tax earnings of the other building products businesses were approximately $1.6 billion in 2020, an increase of 4.6% over 2019. The earnings increase reflected the effects of lower average input costs, operating cost containment efforts and lower facilities closure costs.

2019 versus 2018

Revenues of the building products group in 2019 increased $1.65 billion (8.8%) compared to 2018, while pre-tax earnings increased 12.8% over 2018. Pre-tax earnings as percentages of revenues were 13.0% in 2019 and 12.5% in 2018.

Clayton Homes' revenues were approximately $7.3 billion in 2019, an increase of $1.3 billion (21.5%) over 2018. The comparative increase was primarily due to a 26% increase in home sales, reflecting a net increase in units sold and changes in sales mix. Unit sales of site-built homes increased 84% in 2019 over 2018, primarily due to business acquisitions, while average prices declined 5%. Manufactured home unit retail sales increased 5% and wholesale sales were 9% lower in 2019. Interest income from lending activities increased 6.7% in 2019 compared to 2018, attributable to increased originations and average outstanding loan balances. Aggregate loan balances outstanding were approximately $15.9 billion at December 31, 2019 compared to $14.7 billion as of December 31, 2018.

Clayton Homes' pre-tax earnings were $1.1 billion in 2019, an increase of $182 million (20.0%) compared to 2018. The increase was attributable to home building activities, which benefitted from the increases in home sales, and to financial services activities. Pre-tax earnings from lending and finance activities increased 12%, primarily due to an increase in interest income attributable to higher average loan balances, increased earnings from other financial services and lower credit losses, partially offset by higher interest expense, attributable to higher average borrowings and interest rates, and by higher other operating costs.

Aggregate revenues of our other building products businesses were $13.0 billion in 2019, an increase of 2.8% versus 2018. Revenues increased for paint and coatings, hard surface flooring and roofing products, attributable to a combination of increased volumes, product mix changes and increased average selling prices, while sales of brick products declined.

Manufacturing, Service and Retailing *(Continued)*

Building products (Continued)

Pre-tax earnings of the other building products businesses were $1.5 billion in 2019, an increase of 8.2% over 2018. Earnings in 2019 benefitted from a combination of increases in selling prices in certain product categories, declining raw material costs for certain commodities and operating cost control initiatives, which were partly offset by the effects of increased facilities closure costs.

Consumer products

The consumer products group includes leisure vehicles (Forest River), several apparel and footwear operations (including Fruit of the Loom, Garan, H.H. Brown Shoe Group and Brooks Sports) and a manufacturer of high-performance alkaline batteries (Duracell). This group also includes custom picture framing products (Larson Juhl) and jewelry products (Richline).

2020 versus 2019

Consumer products revenues increased of $359 million (3.0%) in 2020 versus 2019, while pre-tax earnings increased $146 million (11.7%). Pre-tax earnings as a percentage of revenues in 2020 increased 0.9 percentage points to 11.5%.

The comparative increase in revenues reflected revenue increases from Forest River and Duracell, partially offset by lower apparel and footwear revenues. Forest River revenues increased 11.7% in 2020 compared to 2019, primarily attributable to a significant increase in recreational vehicle unit sales over the last half of the year and changes in sales mix. Unit sales in the second half of 2020 increased 31% over the second half of 2019. Revenues from Duracell increased 10.0% in 2020 compared to 2019, reflecting the effects of changes in sales mix and increased volume. Apparel and footwear revenues declined 6.1% in 2020 compared to 2019.

Apparel and footwear sales volumes in the first half of 2020, particularly in the second quarter, reflected the negative effects of the pandemic, which included retail store closures, reduced or cancelled orders and pandemic-related disruptions at certain manufacturing facilities. Sales recovered somewhat in the second half of 2020, attributable to higher consumer demand and inventory restocking by retailers. Brooks Sports revenues were higher, partly attributable to the effect of the reduced sales in 2019 that were caused by shipping delays at a new distribution facility.

The comparative increase in pre-tax earnings was primarily attributable to Forest River and Duracell, partially offset by lower earnings from apparel and footwear. The increase reflected the effects of sales volumes changes and ongoing expense management efforts.

2019 versus 2018

Consumer products revenues declined $718 million (5.7%) in 2019 versus 2018, driven by a 12.9% revenue decline from Forest River, primarily due to lower unit sales. Revenues of Duracell increased 1.3% and apparel and footwear revenues declined 1.1% compared to 2018. Although revenues from Brooks Sports increased 3.5% in 2019, its operating results were negatively affected by lost sales associated with problems encountered at a distribution center that opened in the second quarter. In addition, our other apparel and other footwear businesses continue to experience lower sales volumes for certain products, reflecting the shift by major retailers towards private label products.

Consumer products pre-tax earnings increased $43 million (3.6%) in 2019 compared to 2018. The increase was primarily attributable to continuing cost containment efforts across several of the businesses and the effects of a new Duracell product launch, partially offset by the impact of lower recreational vehicle sales at Forest River.

Manufacturing, Service and Retailing *(Continued)*

Service and retailing

A summary of revenues and pre-tax earnings of our service and retailing businesses follows (dollars in millions).

	2020	2019	2018	Percentage change 2020 vs 2019	Percentage change 2019 vs 2018
Revenues					
Service	$ 12,346	$ 13,496	$ 13,333	(8.5)%	1.2%
Retailing	15,832	15,991	15,606	(1.0)	2.5
McLane Company	46,840	50,458	49,987	(7.2)	0.9
	$ 75,018	$ 79,945	$ 78,926		
Pre-tax earnings					
Service	$ 1,600	$ 1,681	$ 1,836	(4.8)%	(8.4)%
Retailing	1,028	874	860	17.6	1.6
McLane Company	251	288	246	(12.8)	17.1
	$ 2,879	$ 2,843	$ 2,942		
Pre-tax earnings as a percentage of revenues					
Service	13.0%	12.5%	13.8%		
Retailing	6.5%	5.5%	5.5%		
McLane Company	0.5%	0.6%	0.5%		

Service

Our service business group offers shared ownership programs for general aviation aircraft (NetJets) and high technology training products and services to operators of aircraft (FlightSafety). We also distribute electronic components (TTI), franchise and service a network of quick service restaurants (Dairy Queen) and offer third party logistics services that primarily serve the petroleum and chemical industries (Charter Brokerage). Other service businesses include transportation equipment leasing (XTRA) and furniture leasing (CORT), electronic news distribution, multimedia and regulatory filings (Business Wire) and the operation of a television station in Miami, Florida (WPLG).

2020 versus 2019

Service group revenues declined $1.15 billion (8.5%) in 2020 compared to 2019 and pre-tax earnings decreased $81 million (4.8%). Pre-tax earnings of the group as a percentage of revenues were 13.0% in 2020 compared to 12.5% in 2019.

The aggregate revenues of NetJets and FlightSafety in 2020 declined $816 million (13.5%) compared to 2019, reflecting lower demand for air travel and aviation services attributable to the COVID-19 pandemic. NetJets experienced a decline in flight hours of 27% and FlightSafety's commercial and corporate simulator training hours declined 30% from 2019. The comparative service group revenue decline was also attributable to the effects of the disposition of the newspaper operations in March of 2020 and lower revenues from CORT, which was driven by lower demand attributable to the effects of the pandemic. Partially offsetting these declines were revenue increases at TTI and at WPLG.

The decline in earnings reflected lower earnings from NetJets, TTI and CORT and from the effects of the divestiture of the newspaper operations, partly offset by higher earnings from XTRA, Business Wire, WPLG and FlightSafety. TTI's earnings decline reflected lower average gross margin rates, attributable to product mix changes and sales price pressures deriving from ample inventory availability. The decline at NetJets was primarily attributable to increased asset impairment charges and restructuring costs, partly offset by lower general and administrative expenses and a slight net increase in margins. The decline at CORT was driven by lower revenues, partly offset by the effects of cost control initiatives. The increase at FlightSafety was attributable to the effects of contract losses recorded in 2019 with respect to an existing government contract and cost control efforts in 2020, which more than offset significantly lower earnings from commercial and corporate training services.

Manufacturing, Service and Retailing *(Continued)*

Service (Continued)

2019 versus 2018

Service group revenues increased $163 million (1.2%) in 2019 compared to 2018, primarily attributable to increased sales at TTI and higher aviation-related services revenues (NetJets and FlightSafety), partially offset by decreases from the media businesses and Charter Brokerage. TTI's sales increased 2% in 2019 compared to the exceptionally high sales levels in 2018. TTI's sales slowed throughout 2019, attributable to softening customer demand, lower average selling prices and the effects of U.S. trade tariffs. The increase in NetJets' revenues in 2019 reflected increased lease revenue, primarily attributable to an increase in aircraft on lease, and increased flight hours, partly offset by lower revenue from prepaid flight cards. The revenue decline at Charter Brokerage was attributable to the divesture of a high revenue, low margin business in mid-2019.

Pre-tax earnings of the service group decreased $155 million (8.4%) compared to 2018. The comparative earnings decline was primarily due to lower earnings from TTI and FlightSafety, partly offset by higher earnings from NetJets. TTI's earnings decline was primarily attributable to lower gross margins, unfavorable foreign currency translation effects and higher operating expenses. The earnings decline at FlightSafety was attributable to pre-tax losses of approximately $165 million recorded in the fourth quarter of 2019 in connection with an existing government contract, partly offset by lower training equipment impairment charges. Earnings from NetJets increased in 2019, primarily attributable to increased revenues and improved fleet and operating efficiencies, which improved operating margins.

Retailing

Our largest retailing business is Berkshire Hathaway Automotive ("BHA"), which consists of over 80 auto dealerships that sell new and pre-owned automobiles and offer repair services and related products and represented 62.6% of our combined retailing revenue in 2020. BHA also operates two insurance businesses, two auto auctions and an automotive fluid maintenance products distributor. Our retailing businesses also include four home furnishings retailing businesses (Nebraska Furniture Mart, R.C. Willey, Star Furniture and Jordan's), which sell furniture, appliances, flooring and electronics and represented 20.6% of the combined retailing revenues in 2020.

Other retailing businesses include three jewelry retailing businesses (Borsheims, Helzberg and Ben Bridge), See's Candies (confectionary products), Pampered Chef (high quality kitchen tools), Oriental Trading Company (party supplies, school supplies and toys and novelties) and Detlev Louis Motorrad ("Louis"), a retailer of motorcycle accessories based in Germany.

2020 versus 2019

Retailing group revenues in 2020 declined $159 million (1.0%) compared to 2019. The spread of COVID-19 throughout the U.S. resulted in the temporary closures or restricted operations at several of our retailing businesses and effected consumer spending patterns during 2020. The severity and duration of the effects from the pandemic varied widely at our retail operations.

BHA's revenues decreased 2.9% in 2020 compared to 2019. BHA's revenues in 2020 reflected decreases in new and pre-owned vehicle sales of 2.6% as well as lower vehicle service and repair revenues. Home furnishings revenues were essentially unchanged in 2020 compared to 2019. The group experienced lower revenues in the first half of 2020, attributable to restricted store hours, which were substantially offset by increased revenues over the second half of the year. However, supply chain disruptions had a negative effect on obtaining product at certain times, which negatively affected sales levels.

The effects of the pandemic contributed to significantly lower sales in 2020 for our jewelry stores, See's Candy and Oriental Trading Company, which were more than offset by significant revenue increases from Pampered Chef and Louis. Sales volumes generally increased and operating results improved beginning in the latter part of the second quarter as our operations slowly reopened.

Manufacturing, Service and Retailing *(Continued)*

Retailing (Continued)

Retail group pre-tax earnings increased $154 million (17.6%) in 2020 from 2019. BHA's pre-tax earnings increased 37.7%, primarily due to lower selling, general and administrative expenses, lower floorplan interest expense and higher average gross sales margin rates. Aggregate pre-tax earnings for the remainder of our retailing group increased 1.1% in 2020 compared to 2019, reflecting higher earnings from the home furnishings businesses and from Pampered Chef, which were substantially offset by lower earnings from our other retailing operations.

Home furnishings group pre-tax earnings increased $79 million (36%) in 2020 versus 2019, reflecting generally higher average gross margin rates, sales mix changes and fewer sales promotions, and from lower advertising and other operating expenses. Certain of our other operations, including Pampered Chef and Louis experienced significant earnings increases in 2020, while others, including See's Candy and Oriental Trading Company, experienced significant declines driven by the negative effects of the pandemic.

2019 versus 2018

Retailing group revenues increased $385 million (2.5%) in 2019 compared to 2018. BHA's revenues increased 4.1% in 2019 over 2018, primarily attributable to an 11.5% increase in pre-owned vehicle sales, vehicle pricing increases, improvement in vehicle finance and service contract activities and vehicle repair work as compared to 2018. New vehicle sales in 2019 were relatively unchanged from 2018. Home furnishings group revenues declined 1.3% in 2019 compared to 2018, as sales were relatively unchanged or lower in each of our home furnishings operations.

Retail group pre-tax earnings increased $14 million (1.6%) in 2019 over 2018. BHA's pre-tax earnings increased 22.7%, primarily due to the increases in earnings from finance and service contract activities, partly offset by higher floorplan interest expense. Home furnishings group pre-tax earnings declined 14.7% versus 2018, reflecting the decline in revenues and generally higher operating expenses.

McLane Company

McLane operates a wholesale distribution business that provides grocery and non-food consumer products to retailers and convenience stores ("grocery") and to restaurants ("foodservice"). McLane also operates businesses that are wholesale distributors of distilled spirits, wine and beer ("beverage"). The grocery and foodservice businesses generate high sales and very low profit margins. These businesses have several significant customers, including Walmart, 7-Eleven, Yum! Brands and others. Grocery sales comprised about two-thirds of McLane's consolidated sales in 2020 with food service comprising most of the remainder. A curtailment of purchasing by any of its significant customers could have an adverse impact on periodic revenues and earnings.

2020 versus 2019

Revenues declined $3.6 billion (7.2%) in 2020 compared to 2019. The decline was attributable to COVID-19 related restaurant closures (particularly in the casual dining category) in the foodservice business and lower sales in certain product categories within the grocery business. McLane operates on a 52/53-week fiscal year and 2020 included 52 weeks compared to 53 weeks in 2019. Otherwise, revenues declined 5.2% in the grocery business and 7.7% in the foodservice business in 2020 as compared to 2019.

Pre-tax earnings decreased $37 million (12.8%) in 2020 as compared to 2019. The earnings decrease included the effects of increased LIFO inventory reserves of $22 million, credit and inventory losses of $12 million in the foodservice operations and the impact of lower sales. McLane continues to operate in an intensely competitive business environment, which is negatively affecting its current operating results. We expect that these operating conditions will continue.

2019 versus 2018

Revenues increased $471 million (0.9%) in 2019 compared to 2018. McLane's results in 2019 included 53 weeks compared to 52 weeks in 2018. Otherwise, revenues decreased roughly 3% in the grocery business and increased 3% in the foodservice business in 2019 as compared to 2018. Pre-tax earnings increased $42 million (17.1%) as compared to 2018. The earnings increase in 2019 reflected an increase in average gross margin rates and changes in business mix, partly offset by increased operating expenses, the largest portion of which was employee costs.

Investment and Derivative Gains (Losses)

A summary of investment and derivative gains and losses follows (dollars in millions).

	2020	2019	2018
Investment gains (losses)	$ 40,905	$ 71,123	$ (22,155)
Derivative gains (losses)	(159)	1,484	(300)
Gains (losses) before income taxes and noncontrolling interests	40,746	72,607	(22,455)
Income taxes and noncontrolling interests	9,155	15,162	(4,718)
Net gains (losses)	$ 31,591	$ 57,445	$ (17,737)
Effective income tax rate	21.7%	20.9%	20.8%

Investment gains (losses)

We are required to include the unrealized gains and losses arising from changes in market prices of investments in equity securities in earnings, which significantly increases the volatility of our periodic net earnings due to the magnitude of our equity securities portfolio and the inherent volatility of equity securities prices. Pre-tax investment gains included net unrealized gains of approximately $55.0 billion in 2020 attributable to changes in market prices of equity securities we held at December 31, 2020 and net losses of approximately $14.0 billion from changes in market prices during 2020 on securities sold during 2020. We recorded pre-tax unrealized investment gains of approximately $69.6 billion in 2019 attributable to changes in market prices in 2019 on equity securities we held at December 31, 2019. Pre-tax unrealized investment losses of approximately $22.7 billion were recorded in 2018 attributable to market price changes in 2018 on equity securities we held at December 31, 2018. Taxable investment gains on equity securities sold, which is the difference between sales proceeds and the original cost basis of the securities sold, were $6.2 billion in 2020, $3.2 billion in 2019 and $3.3 billion in 2018.

We believe that investment gains/losses, whether realized from sales or unrealized from changes in market prices, are often meaningless in terms of understanding our reported consolidated earnings or evaluating our periodic economic performance. We continue to believe the investment gains/losses recorded in earnings, including the changes in market prices for equity securities, in any given period has little analytical or predictive value.

Derivative gains (losses)

Derivative contract gains/losses include the changes in fair value of our equity index put option contract liabilities, which relate to contracts that were originated prior to March 2008. Substantially all remaining contracts will expire by February 2023. The periodic changes in the fair values of these liabilities are recorded in earnings and can be significant, primarily due to the volatility of underlying equity markets. As of December 31, 2020, the intrinsic value of our equity index put option contracts was $727 million and our recorded liability at fair value was approximately $1.1 billion. Our ultimate payment obligations, if any, under our contracts will be determined as of the contract expiration dates based on the intrinsic value as defined under the contracts.

Equity index put option contracts produced pre-tax losses of $159 million in 2020, pre-tax gains of $1.5 billion in 2019 and pre-tax losses of $300 million in 2018. These gains and losses reflected changes in the equity index values and shorter remaining contract durations. Settlement payments to counterparties were relatively insignificant in each of the three years.

Other

A summary of after-tax other earnings/losses follows (in millions).

	2020	2019	2018
Equity method earnings (losses)	$ 665	$ 1,023	$ (1,419)
Acquisition accounting expenses	(783)	(788)	(831)
Goodwill and intangible asset impairments	(10,381)	(96)	(280)
Corporate interest expense, before foreign currency effects	(334)	(280)	(311)
Foreign currency exchange rate gains (losses) on Berkshire and BHFC non-U.S. Dollar senior notes	(764)	58	289
Income tax expense adjustments	(60)	(377)	—
Other, principally corporate investment income	339	884	986
	$ (11,318)	$ 424	$ (1,566)

Other *(Continued)*

After-tax equity method earnings (losses) include our proportionate share of earnings attributable to our investments in Kraft Heinz, Pilot, Berkadia and Electric Transmission of Texas. Our after-tax earnings from Kraft Heinz were $170 million in 2020 and $488 million in 2019 and our after-tax losses were $1,859 million in 2018. Our earnings from Kraft Heinz included our after-tax share of goodwill and other intangible asset impairment charges recorded by Kraft Heinz in each year. Our after-tax share of such charges was $611 million in 2020, $339 million in 2019 and approximately $2.7 billion in 2018.

After-tax acquisition accounting expenses include charges arising from the application of the acquisition method in connection with certain of Berkshire's past business acquisitions. Such charges arise primarily from the amortization or impairment of intangible assets recorded in connection with those business acquisitions. Goodwill and intangible asset impairments in 2020 included after-tax charges of $9.8 billion attributable to impairments of goodwill and certain identifiable intangible assets that were recorded in connection with our acquisition of PCC in 2016. See Critical Accounting Policies on page K-63 for additional details.

Foreign currency exchange rate gains and losses pertain to Berkshire's outstanding Euro denominated debt (€6.85 billion par) and Japanese Yen denominated debt (¥625.5 billion par), and BHFC's Great Britain Pound denominated debt (£1.75 billion par). Changes in foreign currency exchange rates produced gains and losses from the periodic revaluation of these liabilities into U.S. Dollars. The gains and losses recorded in any given period can be significant due to the magnitude of the borrowings and the inherent volatility in foreign currency exchange rates.

The income tax expense adjustments relate to investments that were made between 2015 and 2018 in certain tax equity investment funds. Our investments in these funds aggregated approximately $340 million. In December 2018, we first learned of allegations by federal authorities of fraudulent conduct by the sponsor of these funds. In January 2020, the principals involved in creating the investment funds plead guilty to criminal charges related to the sale of the investments. In the first quarter of 2019, we concluded that it is more likely than not that the previously recognized income tax benefits were not valid.

Financial Condition

Our consolidated balance sheet continues to reflect very significant liquidity and a very strong capital base. Consolidated shareholders' equity at December 31, 2020 was $443.2 billion, an increase of $18.4 billion since December 31, 2019, which was net of common stock repurchases of $24.7 billion. Net earnings attributable to Berkshire shareholders was $42.5 billion and included after-tax gains on our investments of approximately $31.7 billion. During each of the last three years, changes in the market prices of our investments in equity securities produced exceptional volatility in our earnings. Our results in 2020 also included after-tax goodwill and other intangible asset impairments charges of $11.0 billion.

At December 31, 2020, our insurance and other businesses held cash, cash equivalents and U.S. Treasury Bills of $135.0 billion, which included $112.8 billion in U.S. Treasury Bills. Investments in equity and fixed maturity securities (excluding our investment in Kraft Heinz) were $301.6 billion.

Berkshire parent company debt outstanding at December 31, 2020 was $22.7 billion, an increase of $2.8 billion since December 31, 2019. In 2020, Berkshire repaid maturing senior notes of €1.0 billion and issued €1.0 billion of 0.0% senior notes due in 2025. Berkshire also issued ¥195.5 billion of senior notes (approximately $1.8 billion) with a weighted average interest rate of 1.07% and maturity dates ranging from 2023 to 2060. In the first quarter of 2021, senior notes of $1.7 billion will mature, including $665 million (€550 million) that matured in January. In January 2021, Berkshire issued €600 million of 0.5% senior notes due in 2041.

Berkshire's insurance and other subsidiary outstanding borrowings were approximately $18.9 billion at December 31, 2020, which included senior note borrowings of BHFC, a wholly-owned financing subsidiary, of approximately $13.1 billion. BHFC's borrowings are used to fund a portion of loans originated and acquired by Clayton Homes and equipment held for lease by our railcar leasing business. In 2020, BHFC repaid $900 million of maturing senior notes and issued $3.0 billion of senior notes with maturity dates ranging from 2030 to 2050 and a weighted average interest rate of 2.3%. Berkshire guarantees the full and timely payment of principal and interest with respect to BHFC's senior notes. In January 2021, $750 million of BHFC debt matured and BHFC issued $750 million of 2.5% senior notes due in 2051.

Our railroad, utilities and energy businesses (conducted by BNSF and BHE) maintain very large investments in capital assets (property, plant and equipment) and will regularly make significant capital expenditures in the normal course of business. Capital expenditures of these two operations were $9.8 billion in 2020 and we forecast a similar amount of capital expenditures in 2021.

Financial Condition *(Continued)*

BNSF's outstanding debt was $23.2 billion as of December 31, 2020. In 2020, BNSF issued $575 million of 3.05% senior unsecured debentures due in 2051. Outstanding borrowings of BHE and its subsidiaries were $52.2 billion at December 31, 2020, an increase of $9.6 billion since December 31, 2019. In 2020, BHE and its subsidiaries issued new term debt of approximately $7.6 billion with maturity dates ranging from 2025 to 2062 and repaid approximately $3.2 billion of debt. BHE also assumed $5.6 billion in debt in connection with the business acquired from Dominion Energy in November 2020. Berkshire does not guarantee the repayment of debt issued by BNSF, BHE or any of their subsidiaries and is not committed to provide capital to support BNSF, BHE or any of their subsidiaries.

Berkshire's common stock repurchase program as amended permits Berkshire to repurchase its Class A and Class B shares at prices below Berkshire's intrinsic value, as conservatively determined by Warren Buffett, Berkshire's Chairman of the Board and Chief Executive Officer, and Charlie Munger, Vice Chairman of the Board. The program allows share repurchases in the open market or through privately negotiated transactions and does not specify a maximum number of shares to be repurchased. The program is expected to continue indefinitely. We will not repurchase our stock if it reduces the total amount of Berkshire's consolidated cash, cash equivalents and U.S. Treasury Bill holdings below $20 billion. Financial strength and redundant liquidity will always be of paramount importance at Berkshire. In 2020, Berkshire paid $24.7 billion to repurchase shares of its Class A and B common stock.

Contractual Obligations

We are party to contracts associated with ongoing business and financing activities, which will result in cash payments to counterparties in future periods. Certain obligations are included in our Consolidated Balance Sheets, such as notes payable, which require future payments on contractually specified dates and in fixed and determinable amounts. Other obligations pertaining to the acquisition of goods or services in the future, such as certain purchase obligations, are not currently reflected in the financial statements and will be recognized in future periods as the goods are delivered or services are provided. The timing and amount of the payments under insurance and reinsurance contracts are contingent upon the outcome of future events. Actual payments will likely vary, perhaps materially, from the estimated liabilities currently recorded in our Consolidated Balance Sheet.

A summary of our contractual obligations as of December 31, 2020 follows (in millions). Actual payments will likely vary, perhaps significantly, from estimates reflected in the table.

	Estimated payments due by period				
	Total	**2021**	**2022-2023**	**2024-2025**	**After 2025**
Notes payable and other borrowings, including interest	$ 182,004	$ 13,456	$ 23,393	$ 19,596	$ 125,559
Operating leases	6,318	1,342	2,016	1,269	1,691
Purchase obligations *(1)*	48,413	14,552	7,947	5,939	19,975
Unpaid losses and loss adjustment expenses *(2)*	120,820	27,617	28,623	16,144	48,436
Life, annuity and health insurance benefits *(3)*	36,920	2,623	269	540	33,488
Other	26,524	3,136	7,762	1,684	13,942
Total	$ 420,999	$ 62,726	$ 70,010	$ 45,172	$ 243,091

(1) *Primarily related to fuel, capacity, transmission and maintenance contracts and capital expenditure commitments of BHE and BNSF and aircraft purchase commitments of NetJets.*

(2) *Includes unpaid losses and loss adjustment expenses under retroactive reinsurance contracts.*

(3) *Amounts represent estimated undiscounted benefits, net of estimated future premiums, as applicable.*

Critical Accounting Policies

Certain accounting policies require us to make estimates and judgments in determining the amounts reflected in the Consolidated Financial Statements. Such estimates and judgments necessarily involve varying, and possibly significant, degrees of uncertainty. Accordingly, certain amounts currently recorded in the financial statements will likely be adjusted in the future based on new available information and changes in other facts and circumstances. A discussion of our principal accounting policies that required the application of significant judgments as of December 31, 2020 follows.

Property and casualty insurance unpaid losses

We record liabilities for unpaid losses and loss adjustment expenses (also referred to as "gross unpaid losses" or "claim liabilities") based upon estimates of the ultimate amounts payable for losses occurring on or before the balance sheet date. The timing and amount of ultimate loss payments are contingent upon, among other things, the timing of claim reporting from insureds and ceding companies and the final determination of the loss amount through the loss adjustment process. We use a variety of techniques in establishing claim liabilities and all techniques require significant judgments and assumptions.

As of the balance sheet date, recorded claim liabilities include liabilities for reported claims and for claims not yet reported. The period between the loss occurrence date and loss settlement date is the "claim-tail." Property claims usually have relatively short claim-tails, absent litigation. Casualty claims usually have longer claim-tails, occasionally extending for decades. Casualty claims may be more susceptible to litigation and the impact of changing contract interpretations. The legal environment and judicial process further contribute to extending claim-tails.

Our consolidated claim liabilities as of December 31, 2020 were approximately $120.8 billion (including liabilities from retroactive reinsurance), of which 83% related to GEICO and the Berkshire Hathaway Reinsurance Group. Additional information regarding significant uncertainties inherent in the processes and techniques for estimating unpaid losses of these businesses follows.

GEICO

GEICO predominantly writes private passenger auto insurance. As of December 31, 2020, GEICO's gross unpaid losses were $22.9 billion and claim liabilities, net of reinsurance recoverable, were $21.8 billion.

GEICO's claim reserving methodologies produce liability estimates based upon the individual claims. The key assumptions affecting our liability estimates include projections of ultimate claim counts ("frequency") and average loss per claim ("severity"). We utilize a combination of several actuarial estimation methods, including Bornhuetter-Ferguson and chain-ladder methodologies.

Claim liability estimates for automobile liability coverages (such as bodily injury ("BI"), uninsured motorists, and personal injury protection) are more uncertain due to the longer claim-tails, so we establish additional case development estimates. As of December 31, 2020, case development liabilities averaged approximately 33% of the case reserves. We select case development factors through analysis of the overall adequacy of historical case liabilities.

Incurred-but-not-reported ("IBNR") claim liabilities are based on projections of the ultimate number of claims expected (reported and unreported) for each significant coverage. We use historical claim count data to develop age-to-age projections of the ultimate counts by quarterly accident period, from which we deduct reported claims to produce the number of unreported claims. We estimate the average costs per unreported claim and apply such estimates to the unreported claim counts, producing an IBNR liability estimate. We may record additional IBNR estimates when actuarial techniques are difficult to apply.

We test the adequacy of the aggregate claim liabilities using one or more actuarial projections based on claim closure models and paid and incurred loss triangles. Each type of projection analyzes loss occurrence data for claims occurring in a given period and projects the ultimate cost.

Our claim liability estimates recorded at the end of 2019 were reduced by $253 million during 2020, which produced a corresponding increase to pre-tax earnings. The assumptions used to estimate liabilities at December 31, 2020 reflect the most recent frequency and severity results. Future development of recorded liabilities will depend on whether actual frequency and severity of claims are more or less than anticipated.

Property and casualty losses *(Continued)*

GEICO (Continued)

With respect to liabilities for BI claims, we believe it is reasonably possible that average severities will change by at least one percentage point from the severities used in establishing the recorded liabilities at December 31, 2020. We estimate that a one percentage point increase or decrease in BI severities would produce a $300 million increase or decrease in recorded liabilities, with a corresponding decrease or increase in pre-tax earnings. Many of the economic forces that would likely cause BI severity to differ from expectations would likely also cause severities for other injury coverages to differ in the same direction.

Berkshire Hathaway Reinsurance Group

BHRG's liabilities for unpaid losses and loss adjustment expenses derive primarily from reinsurance contracts issued through NICO and General Re. A summary of BHRG's property and casualty unpaid losses and loss adjustment expenses, other than retroactive reinsurance losses and loss adjustment expenses, as of December 31, 2020 follows (in millions).

	Property	Casualty	Total
Reported case liabilities	$ 5,714	$ 9,497	$ 15,211
IBNR liabilities	5,821	14,615	20,436
Gross unpaid losses and loss adjustment expenses	11,535	24,112	35,647
Reinsurance recoverable	181	864	1,045
Net unpaid losses and loss adjustment expenses	$ 11,354	$ 23,248	$ 34,602

Gross unpaid losses and loss adjustment expenses consist primarily of traditional property and casualty coverages written primarily under excess-of-loss and quota-share treaties. Under certain contracts, coverage can apply to multiple lines of business written and the ceding company may not report loss data by such lines consistently, if at all. In those instances, we allocate losses to property and casualty coverages based on internal estimates.

In connection with reinsurance contracts, the nature, extent, timing and perceived reliability of loss information received from ceding companies varies widely depending on the type of coverage and the contractual reporting terms. Contract terms, conditions and coverages also tend to lack standardization and may evolve more rapidly than primary insurance policies.

The nature and extent of loss information provided under many facultative (individual risk) or per occurrence excess contracts may be comparable to the information received under a primary insurance contract. However, loss information is often less detailed with respect to aggregate excess-of-loss and quota-share contracts and is often in a summary format rather than on an individual claim basis. Loss data includes recoverable paid losses, as well as case loss estimates. Ceding companies infrequently provide reliable IBNR estimates to reinsurers.

Loss reporting to reinsurers is typically slower in comparison to primary insurers. In the U.S., such reporting is generally required at quarterly intervals ranging from 30 to 90 days after the end of the quarterly period, while outside of the U.S., reinsurance reporting practices may vary further. In certain countries, clients report annually from 90 to 180 days after the end of the annual period. Reinsurers may assume and cede underlying risks from other reinsurers, which may further delay the reporting of claims. The relative impact of reporting delays on the reinsurer may vary depending on the type of coverage, contractual reporting terms, the magnitude of the claim relative to the attachment point of the reinsurance coverage, and for other reasons.

As reinsurers, the premium and loss data we receive is at least one level removed from the underlying claimant, so there is a risk that the loss data reported is incomplete, inaccurate or the claim is outside the coverage terms. We maintain certain internal procedures in order to determine that the information is complete and in compliance with the contract terms. Generally, our reinsurance contracts permit us to access the ceding company's records with respect to the subject business, thus providing the ability to audit the reported information. In the normal course of business, disputes occasionally arise concerning whether claims are covered by our reinsurance policies. We resolve most coverage disputes through negotiation with the client. If disputes cannot be resolved, our contracts generally provide arbitration or alternative dispute resolution processes. There are no coverage disputes at this time for which an adverse resolution would likely have a material impact on our consolidated results of operations or financial condition.

Property and casualty losses *(Continued)*

Berkshire Hathaway Reinsurance Group (Continued)

Establishing claim liability estimates for reinsurance requires evaluation of loss information received from our clients. We generally rely on the ceding companies reported case loss estimates. We independently evaluate certain reported case losses and if appropriate, we use our own case liability estimate. For instance, as of December 31, 2020, our case loss estimates exceeded ceding company estimates by approximately $800 million for certain legacy workers' compensation claims occurring over 10 years ago. We also periodically conduct detailed reviews of individual client claims, which may cause us to adjust our case estimates.

Although liabilities for losses are initially determined based on pricing and underwriting analysis, BHRG uses a variety of actuarial methodologies that place reliance on the extrapolation of actual historical data, loss development patterns, industry data and other benchmarks, as appropriate. The estimate of the required IBNR liabilities also requires judgment by actuaries and management to reflect the impact of additional factors like change in business mix, volume, claim reporting and handling practices, inflation, social and legal environment and the terms and conditions of the contracts. The methodologies generally fall into one of the following categories or are hybrids of one or more of the following categories:

Paid and incurred loss development methods – these methods consider expected case loss emergence and development patterns, together with expected loss ratios by year. Factors affecting our loss development analysis include, but are not limited to, changes in the following: client claims reporting and settlement practices; the frequency of client company claim reviews; policy terms and coverage (such as loss retention levels and occurrence and aggregate policy limits); loss trends; and legal trends that result in unanticipated losses. Collectively, these factors influence our selections of expected case loss emergence patterns.

Incurred and paid loss Bornhuetter-Ferguson methods – these methods consider actual paid and incurred losses and expected patterns of paid and incurred losses, taking the initial expected ultimate losses into account to determine an estimate of the expected unpaid or unreported losses.

Frequency and severity methods – these methods commonly focus on a review of the number of anticipated claims and the anticipated claims severity and may also rely on development patterns to derive such estimates. However, our processes and techniques for estimating liabilities in such analyses generally rely more on a per-policy assessment of the ultimate cost associated with the individual loss rather than with an analysis of historical development patterns of past losses.

Additional Analysis – in some cases we have established reinsurance claim liabilities on a contract-by-contract basis, determined from case loss estimates reported by the ceding company and IBNR liabilities that are primarily a function of an anticipated loss ratio for the contract and the reported case loss estimate. Liabilities are adjusted upward or downward over time to reflect case losses reported versus expected case losses, which we use to form revised judgement on the adequacy of the expected loss ratio and the level of IBNR liabilities required for unreported claims. Anticipated loss ratios are also revised to include estimates of known major catastrophe events.

Our claim liability estimation process for short-tail lines, primarily property exposures, utilizes a combination of the paid and incurred loss development methods and the incurred and paid loss Bornhuetter-Ferguson methods. Certain catastrophe, individual risk and aviation excess-of-loss contracts tend to generate low frequency/high severity losses. Our processes and techniques for estimating liabilities under such contracts generally rely more on a per contract assessment of the ultimate cost associated with the individual loss event rather than with an analysis of the historical development patterns of past losses.

For our long-tail lines, primarily casualty exposures, we may rely on different methods depending on the maturity of the business, with estimates for the most recent years being based on priced loss expectations and more mature years reflecting the paid or incurred development pattern indications.

In 2020, certain workers' compensation claims reported losses were less than expected. As a result, we reduced estimated ultimate losses for prior years' loss events by $160 million. We estimate that increases of ten percent in the tail of the expected loss emergence pattern and in the expected loss ratios would produce a net increase of approximately $1.1 billion in IBNR liabilities, producing a corresponding decrease in pre-tax earnings. We believe it is reasonably possible for these assumptions to increase at these rates.

Property and casualty losses *(Continued)*

Berkshire Hathaway Reinsurance Group (Continued)

For other casualty losses, excluding asbestos, environmental, and other latent injury claims, the overall change in estimates for prior years' events was not significant in 2020. However, the potential for significant changes in future periods remains. For certain significant casualty and general liability portfolios, we estimate that increases of five percent in the claim-tails of the expected loss emergence patterns and in the expected loss ratios would produce a net increase in our nominal IBNR liabilities and a corresponding reduction in pre-tax earnings of approximately $900 million, although outcomes of greater than or less than $900 million are possible given the diversification in worldwide business.

Estimated ultimate liabilities for asbestos, environmental and other latent injury claims, excluding amounts assumed under retroactive reinsurance contracts increased $468 million in 2020, which produced a corresponding reduction in pre-tax earnings. Net liabilities for such claims were approximately $2.1 billion at December 31, 2020. Loss estimations for these exposures are difficult to determine due to the changing legal environment and increases may be required in the future if new exposures or claimants are identified, new claims are reported or new theories of liability emerge.

Retroactive reinsurance

Our retroactive reinsurance contracts cover loss events occurring before the contract inception dates. Claim liabilities relating to our retroactive reinsurance contracts are predominately related to casualty or liability exposures. We expect the claim-tails to be very long. As of December 31, 2020, gross unpaid losses were $41.0 billion and deferred charge assets were $12.4 billion.

Our contracts are generally subject to maximum limits of indemnifications and, as such, we currently expect that maximum remaining gross losses payable under our retroactive policies will not exceed $56 billion. Absent significant judicial or legislative changes affecting asbestos, environmental or latent injury exposures, we also currently believe it unlikely that losses will develop upward to the maximum losses payable or downward by more than 15% of our estimated gross liability.

We establish liability estimates by individual contract, considering exposure and development trends. In establishing our liability estimates, we often analyze historical aggregate loss payment patterns and project expected ultimate losses under various scenarios. We assign judgmental probability factors to these scenarios and an expected outcome is determined. We then monitor subsequent loss payment activity and review ceding company reports and other available information concerning the underlying losses. We re-estimate the expected ultimate losses when significant events or significant deviations from expected results are revealed.

Certain of our retroactive reinsurance contracts include asbestos, environmental and other latent injury claims. Our estimated liabilities for such claims were approximately $12.5 billion at December 31, 2020. We do not consistently receive reliable detailed data regarding asbestos, environmental and latent injury claims from all ceding companies, particularly with respect to multi-line or aggregate excess-of-loss policies. When possible, we conduct a detailed analysis of the underlying loss data to make an estimate of ultimate reinsured losses. When detailed loss information is unavailable, we develop estimates by applying recent industry trends and projections to aggregate client data. Judgments in these areas necessarily consider the stability of the legal and regulatory environment under which we expect claims will be adjudicated. Legal reform and legislation could also have a significant impact on our ultimate liabilities.

We reduced estimated ultimate liabilities for prior years' retroactive reinsurance contracts by $399 million in 2020, which after the changes in related deferred charge assets, resulted in pre-tax earnings of $230 million. In 2020, we paid losses and loss adjustment expenses of $1.1 billion with respect to these contracts.

Property and casualty losses *(Continued)*

Retroactive reinsurance (Continued)

In connection with our retroactive reinsurance contracts, we also record deferred charge assets, which at contract inception represents the excess, if any, of the estimated ultimate liability for unpaid losses over premiums received. We amortize deferred charge assets, which produces charges to pre-tax earnings in future periods based on the expected timing and amount of loss payments. We also adjust deferred charge balances due to changes in the expected timing and ultimate amount of claim payments. Significant changes in such estimates may have a significant effect on unamortized deferred charge balances and the amount of periodic amortization. Based on the contracts in effect as of December 31, 2020, we currently estimate that amortization expense in 2021 will approximate $1.1 billion.

Other Critical Accounting Policies

Our Consolidated Balance Sheet at December 31, 2020 includes goodwill of acquired businesses of $73.7 billion and other indefinite-lived intangible assets of $18.3 billion. We evaluate these assets for impairment annually in the fourth quarter and on an interim basis if the facts and circumstances lead us to believe that more-likely-not there has been an impairment.

Goodwill and indefinite-lived intangible asset impairment reviews include determining the estimated fair values of our reporting units and intangible assets. The key assumptions and inputs used in such determinations may include forecasting revenues and expenses, cash flows and capital expenditures, as well as an appropriate discount rate and other inputs. Significant judgment by management is required in estimating the fair value of a reporting unit and in performing impairment reviews. Due to the inherent subjectivity and uncertainty in forecasting future cash flows and earnings over long periods of time, actual results may vary materially from the forecasts. If the carrying value of the indefinite-lived intangible asset exceeds fair value, the excess is charged to earnings as an impairment loss. If the carrying value of a reporting unit exceeds the estimated fair value of the reporting unit, then the excess, limited to the carrying amount of goodwill, will be charged to earnings as an impairment loss.

In response to the adverse effects of the COVID-19 pandemic, we considered whether goodwill needed to be reevaluated for impairment during the second quarter of 2020. We determined it was necessary to quantitively reevaluate goodwill for impairment for certain reporting units, and most significantly for PCC. As a result of our reviews, we recorded pre-tax goodwill impairment charges of $10.0 billion and indefinite-lived intangible asset impairment charges of $638 million of which approximately $10 billion related to PCC.

Prior to the reevaluation, the carrying value of goodwill related to PCC was approximately $17 billion. Additionally, the carrying value of PCC's indefinite-lived intangible assets was approximately $14 billion. Substantially all of these amounts were recorded in connection with Berkshire's acquisition of PCC in 2016. The effects of the COVID-19 pandemic on commercial airlines and aircraft manufacturers is particularly severe. We considered a number of factors in our reevaluation, including but not limited to the announcements by airlines concerning potential future demand, employment levels and aircraft orders, announcements by manufacturers on reduced aircraft production, and the actions we are taking or may take to restructure our operations to fit lower expected demand. In our judgment, the timing and extent of the recovery in the commercial airline and aerospace industries may be dependent on the development and wide-scale distribution of medicines and vaccines that effectively treat the virus. Consequently, we deemed it prudent under the prevailing circumstances to increase discount rates and reduce prior long-term forecasts of future cash flows for purposes of reviewing for impairments.

As of December 31, 2020, we concluded it is more likely than not that goodwill recorded in our Consolidated Balance Sheet was not impaired. Making estimates of the fair value of reporting units at this time is and will likely be significantly affected by assumptions on the severity, duration or long-term effects of the pandemic on the reporting unit's business, which we cannot reliably predict. Consequently, any fair value estimates in such instances can be subject to wide variations. The effects of the COVID-19 pandemic could prove to be worse than we currently estimate and could lead us to record additional goodwill or indefinite-lived intangible asset impairment charges in 2021.

We primarily use discounted projected future earnings or cash flow methods in determining fair values. The key assumptions and inputs used in such methods may include forecasting revenues and expenses, cash flows and capital expenditures, as well as an appropriate discount rate and other inputs. A significant amount of judgment is required in estimating the fair value of a reporting unit and in performing goodwill impairment tests.

Market Risk Disclosures

Our Consolidated Balance Sheets include substantial amounts of assets and liabilities whose fair values are subject to market risks. Our significant market risks are primarily associated with equity prices, interest rates, foreign currency exchange rates and commodity prices. The fair values of our investment portfolios and equity index put option contracts remain subject to considerable volatility. The following sections address the significant market risks associated with our business activities.

Equity Price Risk

Equity securities represent a significant portion of our investment portfolio. Strategically, we strive to invest in businesses that possess excellent economics and able and honest management, and we prefer to invest a meaningful amount in each investee. Historically, equity investments have been concentrated in relatively few issuers. At December 31, 2020, approximately 68% of the total fair value of equity securities was concentrated in four issuers.

We often hold our equity investments for long periods and short-term price volatility has occurred in the past and will occur in the future. We also strive to maintain significant levels of shareholder capital and ample liquidity to provide a margin of safety against short-term price volatility.

We are also subject to equity price risk with respect to our equity index put option contracts. Our ultimate liability with respect to these contracts is determined from the movement of the underlying stock index between the contract inception date and expiration date. The fair values of our liabilities arising from these contracts are also affected by changes in other factors such as interest rates and the remaining duration of the contracts.

The following table summarizes our equity securities and derivative contract liabilities with significant equity price risk as of December 31, 2020 and 2019 and the estimated effects of a hypothetical 30% increase and a 30% decrease in market prices as of those dates. The selected 30% hypothetical increase and decrease does not reflect the best or worst case scenario. Indeed, results from declines could be far worse due both to the nature of equity markets and the aforementioned concentrations existing in our equity investment portfolio. Dollar amounts are in millions.

	Fair Value	Hypothetical Price Change	Estimated Fair Value after Hypothetical Change in Prices	Estimated Increase (Decrease) in Net Earnings *(1)*
December 31, 2020				
Investments in equity securities	$ 281,170	30% increase	$ 362,830	$ 63,321
		30% decrease	199,547	(63,293)
Equity index put option contract liabilities	1,065	30% increase	257	638
		30% decrease	2,702	(1,293)
December 31, 2019				
Investments in equity securities	$ 248,027	30% increase	$ 319,445	$ 56,493
		30% decrease	176,749	(56,382)
Equity index put option contract liabilities	968	30% increase	267	554
		30% decrease	2,776	(1,428)

(1) *The estimated increase (decrease) is after income taxes at the statutory rate in effect as of the balance sheet date.*

Interest Rate Risk

We may also invest in bonds, loans or other interest rate sensitive instruments. Our strategy is to acquire or originate such instruments at prices considered appropriate relative to the perceived credit risk. We also issue debt in the ordinary course of business to fund business operations, business acquisitions and for other general purposes. We attempt to maintain high credit ratings, in order to minimize the cost of our debt. We infrequently utilize derivative products, such as interest rate swaps, to manage interest rate risks.

The fair values of our fixed maturity investments, loans and finance receivables, and notes payable and other borrowings will fluctuate in response to changes in market interest rates. In addition, changes in interest rate assumptions used in our equity index put option contract models cause changes in the reported liabilities. Increases and decreases in interest rates generally translate into decreases and increases in fair values of these instruments. Additionally, fair values of interest rate sensitive instruments may be affected by the creditworthiness of the issuer, prepayment options, relative values of alternative investments, the liquidity of the instrument and other general market conditions.

The following table summarizes the estimated effects of hypothetical changes in interest rates on our significant assets and liabilities that are subject to significant interest rate risk at December 31, 2020 and 2019. We assumed that the interest rate changes occur immediately and uniformly to each category of instrument and that there were no significant changes to other factors used to determine the value of the instrument. The hypothetical changes in interest rates do not reflect the best or worst case scenarios. Actual results may differ from those reflected in the table. Dollars are in millions.

		Estimated Fair Value after Hypothetical Change in Interest Rates (bp=basis points)			
	Fair Value	100 bp decrease	100 bp increase	200 bp increase	300 bp increase
December 31, 2020					
Assets:					
Investments in fixed maturity securities	$ 20,410	$ 20,622	$ 20,139	$ 19,879	$ 19,628
Investments in equity securities*	8,891	9,408	8,413	7,970	7,559
Loans and finance receivables	20,554	21,472	19,916	19,219	18,570
Liabilities:					
Notes payable and other borrowings:					
Insurance and other	46,677	50,754	42,785	39,514	36,739
Railroad, utilities and energy	92,593	102,926	83,070	75,484	69,093
Equity index put option contracts	1,065	1,125	1,008	953	900
December 31, 2019					
Assets:					
Investments in fixed maturity securities	$ 18,685	$ 19,008	$ 18,375	$ 18,075	$ 17,787
Investments in equity securities*	10,314	11,016	9,671	9,081	8,539
Loans and finance receivables	17,861	18,527	17,240	16,660	16,116
Liabilities:					
Notes payable and other borrowings:					
Insurance and other	40,589	44,334	37,454	34,799	32,534
Railroad, utilities and energy	76,237	84,758	69,160	63,218	58,193
Equity index put option contracts	968	1,065	877	792	713

* *Occidental Petroleum Cumulative Perpetual Preferred Stock*

Foreign Currency Risk

Certain of our subsidiaries operate in foreign jurisdictions and we transact business in foreign currencies. In addition, we hold investments in common stocks of major multinational companies, who have significant foreign business and foreign currency risk of their own. We generally do not attempt to match assets and liabilities by currency and do not use derivative contracts to manage foreign currency risks in a meaningful way.

Our net assets subject to financial statement translation into U.S. Dollars are primarily in our insurance, utilities and energy and certain manufacturing and service subsidiaries. A portion of our financial statement translation-related impact from changes in foreign currency rates is recorded in other comprehensive income. In addition, we include gains or losses in net earnings related to certain liabilities of Berkshire and U.S. insurance subsidiaries that are denominated in foreign currencies, due to changes in exchange rates. A summary of these gains (losses), after-tax, for each of the years ending December 31, 2020 and 2019 follows (in millions).

	2020	2019
Non-U.S. denominated debt included in net earnings	$ (764)	$ 58
Net liabilities under certain reinsurance contracts included in net earnings	(163)	(92)
Foreign currency translation included in other comprehensive income	1,264	257

Commodity Price Risk

Our subsidiaries use commodities in various ways in manufacturing and providing services. As such, we are subject to price risks related to various commodities. In most instances, we attempt to manage these risks through the pricing of our products and services to customers. To the extent that we are unable to sustain price increases in response to commodity price increases, our operating results will likely be adversely affected. We do not utilize derivative contracts to manage commodity price risks to any significant degree.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

See "Market Risk Disclosures" contained in Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Management's Report on Internal Control Over Financial Reporting

Management of Berkshire Hathaway Inc. is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in the Securities Exchange Act of 1934 Rule 13a-15(f). Under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of the Company's internal control over financial reporting as of December 31, 2020 as required by the Securities Exchange Act of 1934 Rule 13a-15(c). In making this assessment, we used the criteria set forth in the framework in *Internal Control—Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on our evaluation under the framework in *Internal Control—Integrated Framework* (2013), our management concluded that our internal control over financial reporting was effective as of December 31, 2020.

The effectiveness of our internal control over financial reporting as of December 31, 2020 has been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report which appears on page K-67.

Berkshire Hathaway Inc.
February 27, 2021

Item 8. Financial Statements and Supplementary Data

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of
Berkshire Hathaway Inc.
Omaha, Nebraska

Opinions on the Financial Statements and Internal Control over Financial Reporting
We have audited the accompanying consolidated balance sheets of Berkshire Hathaway Inc. and subsidiaries (the "Company") as of December 31, 2020 and 2019, the related consolidated statements of earnings, comprehensive income, changes in shareholders' equity, and cash flows, for each of the three years in the period ended December 31, 2020, and the related notes (collectively referred to as the "financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2020, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2020 and 2019, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2020, in conformity with accounting principles generally accepted in the United States of America. Also, in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2020, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by COSO.

Basis for Opinions
The Company's management is responsible for these financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on these financial statements and an opinion on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the US federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the financial statements included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures to respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting
A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM (Continued)

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current-period audit of the financial statements that were communicated or required to be communicated to the audit committee and that (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Unpaid Losses and Loss Adjustment Expenses— Refer to Notes 1 and 15 to the financial statements

Critical Audit Matter Description

The Company's unpaid losses and loss adjustment expenses ("claim liabilities") under short duration property and casualty insurance and reinsurance contracts are $79,854 million as of December 31, 2020. The key assumptions affecting certain claim liabilities include expected loss and expense ("loss") ratios, expected claim count emergence patterns, expected loss payment emergence patterns and expected loss reporting emergence patterns.

Given the subjectivity of estimating these key assumptions, performing audit procedures to evaluate whether claim liabilities were appropriately recorded as of December 31, 2020, required a high degree of auditor judgment and an increased extent of effort, including the need to involve our actuarial specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the key assumptions affecting certain claim liabilities included the following, among others:

- We tested the operating effectiveness of controls over claim liabilities, including those over the key assumptions.
- We evaluated the methods and assumptions used by management to estimate the claim liabilities by:
  - Testing the underlying data that served as the basis for the actuarial analysis, such as historical claims and earned premium, to test that the inputs to the actuarial estimate were reasonable.
  - Comparing management's prior-year claim liabilities to actual development during the current year to identify potential bias in the determination of the claim liabilities.
- With the assistance of our actuarial specialists:
  - We developed independent estimates of the claim liabilities, including loss data and industry claim development factors as needed, and compared our estimates to management's estimates.
  - We compared management's change in ultimate loss and loss adjustment expense to prior year estimates to test the reasonableness of the prior year estimates and assessed unexpected development.

Unpaid Losses and Loss Adjustment Expenses Under Retroactive Reinsurance Contracts — Refer to Notes 1 and 16 to the financial statements

Critical Audit Matter Description

The Company's unpaid losses and loss adjustment expenses ("claim liabilities") for property and casualty retroactive reinsurance contracts are $40,966 million as of December 31, 2020. The key assumptions affecting certain claim liabilities and related deferred charge reinsurance assumed assets ("related assets") include expected loss and expense ("loss") ratios, expected loss payment emergence patterns and expected loss reporting emergence.

Given the subjectivity of estimating these key assumptions, performing audit procedures to evaluate whether claim liabilities were appropriately recorded as of December 31, 2020, required a high degree of auditor judgment and an increased extent of effort, including the need to involve our actuarial specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the key assumptions affecting claim liabilities and related assets included the following, among others:

- We tested the operating effectiveness of controls over claim liabilities and related assets, including those over the key assumptions.

- We evaluated the methods and assumptions used by management to estimate the claim liabilities and related assets by:
  - Testing the underlying data that served as the basis for the actuarial analysis, including historical claims, to test that the inputs to the actuarial estimate were reasonable.
  - Comparing management's prior-year claim liabilities to actual development during the current year to identify potential bias in the determination of the claim liabilities and related assets.
- With the assistance of our actuarial specialists:
  - We developed independent claim liability estimates for certain retroactive reinsurance contracts and compared our estimates to management's estimates. For other retroactive reinsurance contracts and related assets, we evaluated the process used by management to develop the estimated claim liabilities and related assets.
  - We compared management's change in ultimate loss and loss adjustment expense to prior year estimates, assessed unexpected development and assessed internal rates of return.

Goodwill and Indefinite-Lived Intangible Assets — Refer to Notes 1 and 13 to the financial statements

Critical Audit Matter Description

The Company's evaluation of goodwill and indefinite-lived intangible assets for impairment involves the comparison of the fair value of each reporting unit or asset to its carrying value. The Company evaluates goodwill and indefinite-lived intangible assets for impairment at least annually. When evaluating goodwill and indefinite-lived intangible assets for impairment, the fair value of each reporting unit or asset is estimated. Significant judgment is required in estimating fair values and performing impairment tests. The Company primarily uses discounted projected future net earnings or net cash flows and multiples of earnings to estimate fair value, which requires management to make significant estimates and assumptions related to forecasts of future revenue, earnings before interest and taxes ("EBIT"), and discount rates. Changes in these assumptions could have a significant impact on the fair value of reporting units and indefinite-lived intangible assets.

The Precision Castparts Corp. ("PCC") reporting unit reported approximately $31 billion of goodwill and indefinite-lived intangible assets as of December 31, 2019. During the second quarter of 2020, the Company performed an interim reevaluation of the goodwill and indefinite-lived intangible assets at the PCC reporting unit. This determination was made due to disruptions arising from the COVID-19 pandemic that had an adverse impact on the industries in which PCC operates. As a result of the reevaluation, the Company recognized goodwill and indefinite-lived intangible asset impairment charges in the amount of approximately $10 billion, as the fair values of the PCC reporting unit and indefinite-lived intangible assets were less than their respective carrying values. As a result, PCC reported goodwill and indefinite-lived intangible assets of approximately $21 billion as of December 31, 2020.

Given the significant judgments made by management to estimate the fair value of the PCC reporting unit and certain customer relationships with indefinite lives along with the difference between their fair values and carrying values, performing audit procedures to evaluate the reasonableness of management's estimates and assumptions related to forecasts of future revenue and EBIT and the selection of the discount rate required a high degree of auditor judgment and an increased extent of effort, including the need to involve our fair value specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to forecasts of future revenue and EBIT and the selection of the discount rate for the PCC reporting unit and certain customer relationships included the following, among others:

- We tested the effectiveness of controls over goodwill and indefinite-lived intangible assets, including those over the forecasts of future revenue and EBIT and the selection of the discount rate.
- We evaluated management's ability to accurately forecast future revenue and EBIT by comparing prior year forecasts to actual results in the respective years.
- We evaluated the reasonableness of management's current revenue and EBIT forecasts by comparing the forecasts to historical results and forecasted information included in analyst and industry reports and certain peer companies' disclosures.
- With the assistance of our fair value specialists, we evaluated the valuation methodologies, the long-term growth rates and discount rate, including testing the underlying source information and the mathematical accuracy of the calculations, and developed a range of independent estimates and compared those to the long-term growth rates and discount rate selected by management.

/s/ Deloitte & Touche LLP

Omaha, Nebraska
February 27, 2021

We have served as the Company's auditor since 1985.

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED BALANCE SHEETS
(dollars in millions)

	December 31,	
	2020	2019
ASSETS		
Insurance and Other:		
Cash and cash equivalents*	$ 44,714	$ 61,151
Short-term investments in U.S. Treasury Bills	90,300	63,822
Investments in fixed maturity securities	20,410	18,685
Investments in equity securities	281,170	248,027
Equity method investments	17,303	17,505
Loans and finance receivables	19,201	17,527
Other receivables	32,310	32,418
Inventories	19,208	19,852
Property, plant and equipment	21,200	21,438
Equipment held for lease	14,601	15,065
Goodwill	47,121	57,052
Other intangible assets	29,462	31,051
Deferred charges under retroactive reinsurance contracts	12,441	13,747
Other	14,580	13,232
	664,021	630,572
Railroad, Utilities and Energy:		
Cash and cash equivalents*	3,276	3,024
Receivables	3,542	3,417
Property, plant and equipment	151,216	137,838
Goodwill	26,613	24,830
Regulatory assets	3,440	2,881
Other	21,621	15,167
	209,708	187,157
	$ 873,729	$ 817,729

* *Includes U.S. Treasury Bills with maturities of three months or less when purchased of $23.2 billion at December 31, 2020 and $37.1 billion at December 31, 2019.*

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED BALANCE SHEETS
(dollars in millions)

	December 31, 2020	December 31, 2019
LIABILITIES AND SHAREHOLDERS' EQUITY		
Insurance and Other:		
Unpaid losses and loss adjustment expenses	$ 79,854	$ 73,019
Unpaid losses and loss adjustment expenses under retroactive reinsurance contracts	40,966	42,441
Unearned premiums	21,395	19,782
Life, annuity and health insurance benefits	21,616	20,155
Other policyholder liabilities	8,670	7,723
Accounts payable, accruals and other liabilities	29,279	27,611
Derivative contract liabilities	1,065	968
Aircraft repurchase liabilities and unearned lease revenues	5,856	5,281
Notes payable and other borrowings	41,522	37,590
	250,223	234,570
Railroad, Utilities and Energy:		
Accounts payable, accruals and other liabilities	15,224	14,708
Regulatory liabilities	7,475	7,311
Notes payable and other borrowings	75,373	65,778
	98,072	87,797
Income taxes, principally deferred	74,098	66,799
Total liabilities	422,393	389,166
Shareholders' equity:		
Common stock	8	8
Capital in excess of par value	35,626	35,658
Accumulated other comprehensive income	(4,243)	(5,243)
Retained earnings	444,626	402,493
Treasury stock, at cost	(32,853)	(8,125)
Berkshire Hathaway shareholders' equity	443,164	424,791
Noncontrolling interests	8,172	3,772
Total shareholders' equity	451,336	428,563
	$ 873,729	$ 817,729

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF EARNINGS
(dollars in millions except per share amounts)

	Year Ended December 31,		
	2020	**2019**	**2018**
Revenues:			
Insurance and Other:			
Insurance premiums earned	$ 63,401	$ 61,078	$ 57,418
Sales and service revenues	127,044	134,989	133,336
Leasing revenues	5,209	5,856	5,732
Interest, dividend and other investment income	8,092	9,240	7,678
	203,746	211,163	204,164
Railroad, Utilities and Energy:			
Freight rail transportation revenues	20,750	23,357	23,703
Energy operating revenues	15,540	15,353	15,555
Service revenues and other income	5,474	4,743	4,415
	41,764	43,453	43,673
Total revenues	245,510	254,616	247,837
Investment and derivative contract gains/losses:	40,746	72,607	(22,455)
Costs and expenses:			
Insurance and Other:			
Insurance losses and loss adjustment expenses	43,951	44,456	39,906
Life, annuity and health insurance benefits	5,812	4,986	5,699
Insurance underwriting expenses	12,798	11,200	9,793
Cost of sales and services	101,091	107,041	106,083
Cost of leasing	3,520	4,003	4,061
Selling, general and administrative expenses	19,809	19,226	17,856
Goodwill and intangible asset impairments	10,671	96	382
Interest expense	1,105	1,056	1,035
	198,757	192,064	184,815
Railroad, Utilities and Energy:			
Freight rail transportation expenses	13,120	15,436	16,045
Utilities and energy cost of sales and other expenses	11,638	11,296	11,641
Other expenses	4,796	4,002	3,895
Interest expense	2,978	2,905	2,818
	32,532	33,639	34,399
Total costs and expenses	231,289	225,703	219,214
Earnings before income taxes and equity method earnings (losses)	54,967	101,520	6,168
Equity method earnings (losses)	726	1,176	(2,167)
Earnings before income taxes	55,693	102,696	4,001
Income tax expense (benefit)	12,440	20,904	(321)
Net earnings	43,253	81,792	4,322
Earnings attributable to noncontrolling interests	732	375	301
Net earnings attributable to Berkshire Hathaway shareholders	$ 42,521	$ 81,417	$ 4,021
Net earnings per average equivalent Class A share	$ 26,668	$ 49,828	$ 2,446
Net earnings per average equivalent Class B share*	$ 17.78	$ 33.22	$ 1.63
Average equivalent Class A shares outstanding	1,594,469	1,633,946	1,643,795
Average equivalent Class B shares outstanding	2,391,703,454	2,450,919,020	2,465,692,368

* *Class B shares are economically equivalent to one-fifteen-hundredth of a Class A share. Accordingly, net earnings per average equivalent Class B share outstanding is equal to one-fifteen-hundredth of the equivalent Class A amount. See Note 22.*

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(dollars in millions)

	Year Ended December 31,		
	2020	2019	2018
Net earnings	$ 43,253	$ 81,792	$ 4,322
Other comprehensive income:			
Unrealized appreciation of investments	74	142	(438)
Applicable income taxes	(19)	(31)	84
Foreign currency translation	1,284	323	(1,531)
Applicable income taxes	3	(28)	62
Defined benefit pension plans	(355)	(711)	(571)
Applicable income taxes	74	155	143
Other, net	(42)	(48)	(12)
Other comprehensive income, net	1,019	(198)	(2,263)
Comprehensive income	44,272	81,594	2,059
Comprehensive income attributable to noncontrolling interests	751	405	249
Comprehensive income attributable to Berkshire Hathaway shareholders	$ 43,521	$ 81,189	$ 1,810

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY
(dollars in millions)

	Berkshire Hathaway shareholders' equity					
	Common stock and capital in excess of par value	Accumulated other comprehensive income	Retained earnings	Treasury stock	Non-controlling interests	Total
Balance December 31, 2017	$ 35,702	$58,571	$255,786	$ (1,763)	$ 3,658	$351,954
Adoption of new accounting pronouncements	—	(61,375)	61,305	—	—	(70)
Net earnings	—	—	4,021	—	301	4,322
Other comprehensive income, net	—	(2,211)	—	—	(52)	(2,263)
Issuance (acquisition) of common stock	59	—	—	(1,346)	—	(1,287)
Transactions with noncontrolling interests	(46)	—	—	—	(110)	(156)
Balance December 31, 2018	35,715	(5,015)	321,112	(3,109)	3,797	352,500
Net earnings	—	—	81,417	—	375	81,792
Other comprehensive income, net	—	(228)	—	—	30	(198)
Issuance (acquisition) of common stock	21	—	—	(5,016)	—	(4,995)
Transactions with noncontrolling interests	(70)	—	(36)	—	(430)	(536)
Balance December 31, 2019	35,666	(5,243)	402,493	(8,125)	3,772	428,563
Net earnings	—	—	42,521	—	732	43,253
Adoption of new accounting pronouncement	—	—	(388)	—	—	(388)
Other comprehensive income, net	—	1,000	—	—	19	1,019
Issuance (acquisition) of common stock	—	—	—	(24,728)	—	(24,728)
Transactions with noncontrolling interests	(32)	—	—	—	3,649	3,617
Balance December 31, 2020	$ 35,634	$ (4,243)	$444,626	$(32,853)	$ 8,172	$451,336

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF CASH FLOWS
(dollars in millions)

	Year Ended December 31,		
	2020	2019	2018
Cash flows from operating activities:			
Net earnings	$ 43,253	$ 81,792	$ 4,322
Adjustments to reconcile net earnings to operating cash flows:			
Investment (gains) losses	(40,905)	(71,123)	22,155
Depreciation and amortization	10,596	10,064	9,779
Other, including asset impairment charges	11,263	(1,254)	2,957
Changes in operating assets and liabilities:			
Losses and loss adjustment expenses	4,819	6,087	3,449
Deferred charges reinsurance assumed	1,307	357	1,174
Unearned premiums	1,587	1,707	1,794
Receivables and originated loans	(1,609)	(2,303)	(3,443)
Other assets	(1,109)	(2,011)	(1,832)
Other liabilities	3,376	190	2,002
Income taxes	7,195	15,181	(4,957)
Net cash flows from operating activities	39,773	38,687	37,400
Cash flows from investing activities:			
Purchases of equity securities	(30,161)	(18,642)	(43,210)
Sales of equity securities	38,756	14,336	18,783
Purchases of U.S. Treasury Bills and fixed maturity securities	(208,429)	(136,123)	(141,844)
Sales of U.S. Treasury Bills and fixed maturity securities	31,873	15,929	39,693
Redemptions and maturities of U.S. Treasury Bills and fixed maturity securities	149,709	137,767	113,045
Purchases of loans and finance receivables	(772)	(75)	(1,771)
Collections of loans and finance receivables	393	345	342
Acquisitions of businesses, net of cash acquired	(2,532)	(1,683)	(3,279)
Purchases of property, plant and equipment and equipment held for lease	(13,012)	(15,979)	(14,537)
Other	(3,582)	(1,496)	(71)
Net cash flows from investing activities	(37,757)	(5,621)	(32,849)
Cash flows from financing activities:			
Proceeds from borrowings of insurance and other businesses	5,925	8,144	2,409
Repayments of borrowings of insurance and other businesses	(2,700)	(5,095)	(7,395)
Proceeds from borrowings of railroad, utilities and energy businesses	8,445	5,400	7,019
Repayments of borrowings of railroad, utilities and energy businesses	(3,761)	(2,638)	(4,213)
Changes in short term borrowings, net	(1,118)	266	(1,943)
Acquisition of treasury stock	(24,706)	(4,850)	(1,346)
Other	(429)	(497)	(343)
Net cash flows from financing activities	(18,344)	730	(5,812)
Effects of foreign currency exchange rate changes	92	25	(140)
Increase (decrease) in cash and cash equivalents and restricted cash	(16,236)	33,821	(1,401)
Cash and cash equivalents and restricted cash at beginning of year	64,632	30,811	32,212
Cash and cash equivalents and restricted cash at end of year *	$ 48,396	$ 64,632	$ 30,811
** Cash and cash equivalents and restricted cash at end of year are comprised of the following:*			
Insurance and Other	*$ 44,714*	*$ 61,151*	*$ 27,749*
Railroad, Utilities and Energy	*3,276*	*3,024*	*2,612*
Restricted cash, included in other assets	*406*	*457*	*450*
	$ 48,396	*$ 64,632*	*$ 30,811*

See accompanying Notes to Consolidated Financial Statements

(1) Significant accounting policies and practices

(a) Nature of operations and basis of consolidation

Berkshire Hathaway Inc. ("Berkshire") is a holding company owning subsidiaries engaged in a number of diverse business activities, including insurance and reinsurance, freight rail transportation, utilities and energy, manufacturing, service and retailing. In these notes the terms "us," "we," or "our" refer to Berkshire and its consolidated subsidiaries. Further information regarding our reportable business segments is contained in Note 27. Information concerning business acquisitions completed over the past three years appears in Note 2. We believe that reporting the Railroad, Utilities and Energy subsidiaries separately is appropriate given the relative significance of their long-lived assets, capital expenditures and debt, which is not guaranteed by Berkshire.

The accompanying Consolidated Financial Statements include the accounts of Berkshire consolidated with the accounts of all subsidiaries and affiliates in which we hold a controlling financial interest as of the financial statement date. Normally a controlling financial interest reflects ownership of a majority of the voting interests. We consolidate variable interest entities ("VIE") when we possess both the power to direct the activities of the VIE that most significantly affect its economic performance, and we (a) are obligated to absorb the losses that could be significant to the VIE or (b) hold the right to receive benefits from the VIE that could be significant to the VIE. Intercompany accounts and transactions have been eliminated.

(b) Use of estimates in preparation of financial statements

We prepare our Consolidated Financial Statements in conformity with accounting principles generally accepted in the United States ("GAAP") which requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities at the balance sheet date and the reported amounts of revenues and expenses during the period. Our estimates of unpaid losses and loss adjustment expenses are subject to considerable estimation error due to the inherent uncertainty in projecting ultimate claim costs. In addition, estimates and assumptions associated with the amortization of deferred charges on retroactive reinsurance contracts, determinations of fair values of certain financial instruments and evaluations of goodwill and identifiable intangible assets for impairment require considerable judgment. Actual results may differ from the estimates used in preparing our Consolidated Financial Statements.

The novel coronavirus ("COVID-19") spread rapidly across the world in 2020 and was declared a pandemic by the World Health Organization. The government and private sector responses to contain its spread began to significantly affect our operating businesses in March. COVID-19 has since adversely affected nearly all of our operations, although the effects are varying significantly. The duration and extent of the effects over longer terms cannot be reasonably estimated at this time. The risks and uncertainties resulting from the pandemic that may affect our future earnings, cash flows and financial condition include the time necessary to distribute safe and effective vaccines and to vaccinate a significant number of people in the U.S. and throughout the world as well as the long-term effect from the pandemic on the demand for certain of our products and services. Accordingly, significant estimates used in the preparation of our financial statements including those associated with evaluations of certain long-lived assets, goodwill and other intangible assets for impairment, expected credit losses on amounts owed to us and the estimations of certain losses assumed under insurance and reinsurance contracts may be subject to significant adjustments in future periods.

(c) Cash and cash equivalents and short-term investments in U.S. Treasury Bills

Cash equivalents consist of demand deposit and money market accounts and investments (including U.S. Treasury Bills) with maturities of three months or less when purchased. Short-term investments in U.S. Treasury Bills consist of U.S. Treasury Bills with maturities exceeding three months at the time of purchase and are stated at amortized cost, which approximates fair value.

(1) Significant accounting policies and practices *(Continued)*

(d) Investments in fixed maturity securities

We classify investments in fixed maturity securities on the acquisition date and at each balance sheet date. Securities classified as held-to-maturity are carried at amortized cost, reflecting the ability and intent to hold the securities to maturity. Securities classified as trading are acquired with the intent to sell in the near term and are carried at fair value with changes in fair value reported in earnings. All other securities are classified as available-for-sale and are carried at fair value. Substantially all of these investments are classified as available-for-sale. We amortize the difference between the original cost and maturity value of a fixed maturity security to earnings using the interest method.

We record investment gains and losses on available-for-sale fixed maturity securities when the securities are sold, as determined on a specific identification basis. For securities in an unrealized loss position, we recognize a loss in earnings for the excess of amortized cost over fair value if we intend to sell before the price recovers. Otherwise, we evaluate as of the balance sheet date whether the unrealized losses are attributable to credit losses or other factors. We consider the severity of the decline in value, creditworthiness of the issuer and other relevant factors. We record an allowance for credit losses, limited to the excess of amortized cost over fair value, along with a corresponding charge to earnings if the present value of estimated cash flows is less than the present value of contractual cash flows. The allowance may be subsequently increased or decreased based on the prevailing facts and circumstances. The portion of the unrealized loss that we believe is not related to a credit loss is recognized in other comprehensive income.

(e) Investments in equity securities

We carry substantially all investments in equity securities at fair value and record the subsequent changes in fair values in the Consolidated Statements of Earnings as a component of investment gains/losses.

(f) Investments under the equity method

We utilize the equity method to account for investments when we possess the ability to exercise significant influence, but not control, over the operating and financial policies of the investee. The ability to exercise significant influence is presumed when the investor possesses more than 20% of the voting interests of the investee. This presumption may be overcome based on specific facts and circumstances that demonstrate that the ability to exercise significant influence is restricted. We apply the equity method to investments in common stock and to other investments when such other investments possess substantially identical subordinated interests to common stock.

In applying the equity method, we record the investment at cost and subsequently increase or decrease the carrying amount of the investment by our proportionate share of the net earnings or losses and other comprehensive income of the investee. We record dividends or other equity distributions as reductions in the carrying value of the investment. In the event that net losses of the investee reduce the carrying amount to zero, additional net losses may be recorded if other investments in the investee are at-risk, even if we have not committed to provide financial support to the investee. Such additional equity method losses, if any, are based upon the change in our claim on the investee's book value.

(g) Receivables

Receivables primarily consist of balances due from customers, insurance premiums receivable and reinsurance losses recoverable. Trade receivables, insurance premium receivables and other receivables are primarily short-term in nature with stated collection terms of less than one year from the date of origination. Reinsurance recoverables are comprised of amounts ceded under reinsurance contracts or pursuant to mandatory government-sponsored insurance programs. Reinsurance recoverables relate to claims for unpaid losses and loss adjustment expenses arising from property and casualty contracts and claim benefits under life and health insurance contracts. Receivables are stated net of estimated allowances for uncollectible balances. Prior to 2020, we recorded provisions for uncollectible balances when it was probable counterparties or customers would be unable to pay all amounts due based on the contractual terms and historical loss history.

As of January 1, 2020, we adopted a new accounting pronouncement that affects the measurement of allowances for credit losses. See Note 1(w). In measuring credit loss allowances, we primarily utilize credit loss history, with adjustments to reflect current or expected future economic conditions when reasonable and supportable forecasts of losses deviate from historical experience. In evaluating expected credit losses of reinsurance recoverable on unpaid losses, we review the credit quality of the counterparty and consider right-of-offset provisions within reinsurance contracts and other forms of credit enhancement including, collateral, guarantees and other available information. We charge-off receivables against the allowances after all reasonable collection efforts are exhausted.

(1) Significant accounting policies and practices *(Continued)*

(h) Loans and finance receivables

Loans and finance receivables are primarily manufactured home loans, and to lesser extent, commercial loans and site-built home loans. We carry substantially all of these loans at amortized cost, net of allowances for expected credit losses, based on our ability and intent to hold such loans to maturity. Acquisition costs and loan origination and commitment costs paid or fees received along with acquisition premiums or discounts are amortized as yield adjustments over the lives of the loans.

Prior to 2020, credit losses were measured when non-collection was considered probable based on the prevailing facts and circumstances. Beginning in 2020, measurements of expected credit losses include provisions for non-collection, whether the risk is probable or remote. Expected credit losses on manufactured housing installment loans are based on the net present value of future principal payments less estimated expenses related to the charge-off and foreclosure of expected uncollectible loans and include provisions for loans that are not in foreclosure. Our principal credit quality indicator is whether the loans are performing. Expected credit loss estimates consider historical default rates, collateral recovery rates, historical runoff rates, interest rates, reductions of future cash flows for modified loans and the historical time elapsed from last payment until foreclosure, among other factors. In addition, our estimates consider current conditions and reasonable and supportable forecasts.

Loans are considered delinquent when payments are more than 30 days past due. We place loans over 90 days past due on nonaccrual status and accrued but uncollected interest is reversed. Subsequent collections on the loans are first applied to the principal and interest owed for the most delinquent amount. We resume interest income accrual once a loan is less than 90 days delinquent.

Loans are considered non-performing when the foreclosure process has started. Once a loan is in the process of foreclosure, interest income is not recognized unless the foreclosure is cured or the loan is modified. Once a modification is complete, interest income is recognized based on the terms of the new loan. Foreclosed loans are charged off when the collateral is sold. Loans not in foreclosure are evaluated for charge-off based on individual circumstances concerning the future collectability of the loan and the condition of the collateral securing the loan.

(i) Derivatives

We carry derivative contracts in our Consolidated Balance Sheets at fair value, net of reductions permitted under master netting agreements with counterparties. We record the changes in fair value of derivative contracts that do not qualify as hedging instruments for financial reporting purposes in earnings or, if such contracts involve our regulated utilities subsidiaries, as regulatory assets or liabilities when inclusion in regulated rates is probable.

(j) Fair value measurements

As defined under GAAP, fair value is the price that would be received to sell an asset or paid to transfer a liability between market participants in the principal market or in the most advantageous market when no principal market exists. Adjustments to transaction prices or quoted market prices may be required in illiquid or disorderly markets in estimating fair value. Alternative valuation techniques may be appropriate under the circumstances to determine the value that would be received to sell an asset or paid to transfer a liability in an orderly transaction. Market participants are assumed to be independent, knowledgeable, and able and willing to transact an exchange and not acting under duress. Our nonperformance or credit risk is considered in determining the fair value of liabilities. Considerable judgment may be required in interpreting market data used to develop the estimates of fair value. Accordingly, estimates of fair value presented herein are not necessarily indicative of the amounts that could be realized in a current or future market exchange.

(k) Inventories

Inventories consist of manufactured goods, goods or products acquired for resale and homes constructed for sale. Manufactured inventory costs include materials, direct and indirect labor and factory overhead. At December 31, 2020, we used the last-in-first-out ("LIFO") method to value approximately 35% of consolidated inventories with the remainder primarily determined under first-in-first-out and average cost methods. Non-LIFO inventories are stated at the lower of cost or net realizable value. The excess of current or replacement costs over costs determined under LIFO was approximately $1.1 billion as of December 31, 2020 and $950 million as of December 31, 2019.

(1) Significant accounting policies and practices *(Continued)*

(l) Property, plant and equipment

We record additions to property, plant and equipment used in operations at cost, which includes asset additions, improvements and betterments. With respect to constructed assets, all materials, direct labor and contract services as well as certain indirect costs are capitalized. Indirect costs include interest over the construction period. With respect to constructed assets of our utility and energy subsidiaries that are subject to authoritative guidance for regulated operations, capitalized costs also include an allowance for funds used during construction, which represents the cost of equity funds used to finance the construction of the regulated facilities. Normal repairs and maintenance and other costs that do not improve the property, extend useful lives or otherwise do not meet capitalization criteria are charged to expense as incurred.

Depreciation of assets of our regulated utilities and railroad is generally determined using group depreciation methods where rates are based on periodic depreciation studies approved by the applicable regulator. Under group depreciation, a composite rate is applied to the gross investment in a particular class of property, despite differences in the service life or salvage value of individual property units within the same class. When such assets are retired or sold, no gain or loss is recognized. Gains or losses on disposals of all other assets are recorded through earnings.

We depreciate property, plant and equipment used by our other businesses to estimated salvage value primarily using the straight-line method over estimated useful lives. Ranges of estimated useful lives of depreciable assets used in our other businesses are as follows: buildings and improvements – 5 to 50 years, machinery and equipment – 3 to 25 years and furniture, fixtures and other – 3 to 15 years. Ranges of estimated useful lives of depreciable assets unique to our railroad business are as follows: track structure and other roadway – 10 to 100 years and locomotives, freight cars and other equipment – 6 to 43 years. Ranges of estimated useful lives of assets unique to our regulated utilities and energy businesses are as follows: utility generation, transmission and distribution systems – 5 to 80 years, interstate natural gas pipeline assets – 3 to 80 years and independent power plants and other assets – 3 to 40 years.

We evaluate property, plant and equipment for impairment when events or changes in circumstances indicate that the carrying value of such assets may not be recoverable or when the assets are held for sale. Upon the occurrence of a triggering event, we assess whether the estimated undiscounted cash flows expected from the use of the asset and the residual value from the ultimate disposal of the asset exceeds the carrying value. If the carrying value exceeds the estimated recoverable amounts, we reduce the carrying value to fair value and record an impairment loss in earnings, except with respect to impairment of assets of our regulated utility and energy subsidiaries where the impacts of regulation are considered in evaluating the carrying value.

(m) Leases

We are party to contracts where we lease property to others ("lessor" contracts) and where we lease property from others ("lessee" contracts). We record acquisitions of and additions to equipment that we lease to others at cost. We depreciate equipment held for lease to estimated salvage value primarily using the straight-line method over estimated useful lives ranging from 3 to 35 years. We use declining balance deprecation methods for assets when the revenue-earning power of the asset is relatively greater during the earlier years of its life and maintenance and repair costs increase during the later years. We also evaluate equipment held for lease for impairment consistent with policies for property, plant and equipment.

When we lease assets from others, we record right-of-use assets and lease liabilities. Right-of-use assets represent our right to use an underlying asset for the lease term and lease liabilities represent our obligation to make lease payments arising from the lease. In this regard, lease payments include fixed payments and variable payments that depend on an index or rate. The lease term is generally the non-cancellable lease period. Certain lease contracts contain renewal options or other terms that provide for variable payments based on performance or usage. Options are not included in determining right-of-use assets or lease liabilities unless it is reasonably certain that options will be exercised. Generally, incremental borrowing rates are used in measuring lease liabilities. Right-of-use assets are subject to review for impairment.

(1) Significant accounting policies and practices *(Continued)*

(n) Goodwill and other intangible assets

Goodwill represents the excess of the acquisition price of a business over the fair value of identified net assets of that business. We evaluate goodwill for impairment at least annually. When evaluating goodwill for impairment, we estimate the fair value of the reporting unit. Several methods may be used to estimate a reporting unit's fair value, including market quotations, asset and liability fair values and other valuation techniques, including, but not limited to, discounted projected future net earnings or net cash flows and multiples of earnings. If the carrying amount of a reporting unit, including goodwill, exceeds the estimated fair value, then the excess is charged to earnings as an impairment loss.

Intangible assets with indefinite lives are also tested for impairment at least annually and when events or changes in circumstances indicate that, more-likely-than-not, the asset is impaired. Significant judgment is required in estimating fair values and performing goodwill and indefinite-life intangible asset impairment tests. We amortize intangible assets with finite lives in a pattern that reflects the expected consumption of related economic benefits or on a straight-line basis over the estimated economic useful lives. Intangible assets with finite lives are reviewed for impairment when events or changes in circumstances indicate that the carrying amount may not be recoverable.

(o) Revenue recognition

We earn insurance premiums on prospective property/casualty insurance and reinsurance contracts over the loss exposure or coverage period in proportion to the level of protection provided. In most cases, such premiums are earned ratably over the term of the contract with unearned premiums computed on a monthly or daily pro-rata basis. Premiums on retroactive property/casualty reinsurance contracts are earned at the inception of the contracts, as all underlying loss events covered by the policies occurred prior to contract inception. Premiums for life reinsurance and annuity contracts are earned when due. Premiums earned are stated net of amounts ceded to reinsurers. Premiums earned on contracts with experience-rating provisions reflect estimated loss experience under such contracts.

Sales and service revenues are recognized when goods or services are transferred to a customer. A good or service is transferred when (or as) the customer obtains control of that good or service. Revenues are based on the consideration we expect to receive in connection with our promises to deliver goods and services to our customers.

We manufacture and/or distribute a wide variety of industrial, building and consumer products. Our sales contracts provide customers with these products through wholesale and retail channels in exchange for consideration specified under the contracts. Contracts generally represent customer orders for individual products at stated prices. Sales contracts may contain either single or multiple performance obligations. In instances where contracts contain multiple performance obligations, we allocate the revenue to each obligation based on the relative stand-alone selling prices of each product or service.

Sales revenue reflects reductions for returns, allowances, volume discounts and other incentives, some of which may be contingent on future events. In certain customer contracts, sales revenue includes certain state and local excise taxes billed to customers on specified products when those taxes are levied directly upon us by the taxing authorities. Sales revenue excludes sales taxes and value-added taxes collected on behalf of taxing authorities. Sales revenue includes consideration for shipping and other fulfillment activities performed prior to the customer obtaining control of the goods. We also elect to treat consideration for such services performed after control has passed to the customer as sales revenue.

Our product sales revenues are generally recognized at a point in time when control of the product transfers to the customer, which coincides with customer pickup or product delivery or acceptance, depending on terms of the arrangement. We recognize sales revenues and related costs with respect to certain contracts over time, primarily from certain castings, forgings and aerostructures contracts. Control of the product units under these contracts transfers continuously to the customer as the product is manufactured. These products generally have no alternative use and the contract requires the customer to provide reasonable compensation if terminated for reasons other than breach of contract.

(1) Significant accounting policies and practices *(Continued)*

(o) Revenue recognition (Continued)

Our energy revenue derives primarily from tariff-based sales arrangements approved by various regulatory commissions. These tariff-based revenues are mainly comprised of energy, transmission, distribution and natural gas and have performance obligations to deliver energy products and services to customers which are satisfied over time as energy is delivered or services are provided. Our nonregulated energy revenue primarily relates to our renewable energy business. Energy revenues are equivalent to the amounts we have the right to invoice and correspond directly with the value to the customer of the performance to date and include billed and unbilled amounts. Payments from customers are generally due within 30 days of billing. Rates charged for energy products and services are established by regulators or contractual arrangements that establish the transaction price, as well as the allocation of price among the separate performance obligations. When preliminary regulated rates are permitted to be billed prior to final approval by the applicable regulator, certain revenue collected may be subject to refund and a liability for estimated refunds is accrued.

The primary performance obligation under our freight rail transportation service contracts is to move freight from a point of origin to a point of destination. The performance obligations are represented by bills of lading which create a series of distinct services that have a similar pattern of transfer to the customer. The revenues for each performance obligation are based on various factors including the product being shipped, the origin and destination pair and contract incentives, which are outlined in various private rate agreements, common carrier public tariffs, interline foreign road agreements and pricing quotes. The transaction price is generally a per car/unit amount to transport railcars from a specified origin to a specified destination. Freight revenues are recognized over time as the service is performed because the customer simultaneously receives and consumes the benefits of the service. Revenues recognized represent the proportion of the service completed as of the balance sheet date. Invoices for freight transportation services are generally issued to customers and paid within 30 days or less. Customer incentives, which are primarily provided for shipping a specified cumulative volume or shipping to/from specific locations, are recorded as a reduction to revenue on a pro-rata basis based on actual or projected future customer shipments.

Other service revenues derive from contracts with customers in which performance obligations are satisfied over time, where customers receive and consume benefits as we perform the services, or at a point in time when the services are provided. Other service revenues primarily derive from real estate brokerage, automotive repair, aircraft management, aviation training and franchising and news distribution services.

Leasing revenue is generally recognized ratably over the term of the lease or based on usage, if applicable under the terms of the contract. A substantial portion of our leases are classified as operating leases.

(p) Losses and loss adjustment expenses

We record liabilities for unpaid losses and loss adjustment expenses under property/casualty insurance and reinsurance contracts for loss events that have occurred on or before the balance sheet date. Such liabilities represent the estimated ultimate payment amounts without discounting for time value.

We base liability estimates on (1) loss reports from policyholders and cedents, (2) individual case estimates and (3) estimates of incurred but not reported losses. Losses and loss adjustment expenses in the Consolidated Statements of Earnings include paid claims, claim settlement costs and changes in estimated claim liabilities. Losses and loss adjustment expenses charged to earnings are net of amounts recovered and estimates of amounts recoverable under ceded reinsurance contracts. Reinsurance contracts do not relieve the ceding company of its obligations to indemnify policyholders with respect to the underlying insurance and reinsurance contracts.

(q) Retroactive reinsurance contracts

We record liabilities for unpaid losses and loss adjustment expenses under short duration retroactive reinsurance contracts consistent with other short duration property/casualty insurance and reinsurance contracts described in Note 1(p). With respect to retroactive reinsurance contracts, we also record deferred charge assets at the inception of the contracts, representing the excess, if any, of the estimated ultimate claim liabilities over the premiums earned. We subsequently amortize the deferred charge assets over the expected claim settlement periods using the interest method. Changes to the estimated timing or amount of future loss payments also produce changes in deferred charge balances. We apply changes in such estimates retrospectively and the resulting changes in deferred charge balances, together with periodic amortization, are included in insurance losses and loss adjustment expenses in the Consolidated Statements of Earnings.

(1) Significant accounting policies and practices *(Continued)*

(r) Insurance policy acquisition costs

We capitalize the incremental costs that directly relate to the successful sale of insurance contracts, subject to ultimate recoverability, and we subsequently amortize such costs to underwriting expenses as the related premiums are earned. Direct incremental acquisition costs include commissions, premium taxes and certain other costs associated with successful efforts. We expense all other underwriting costs as incurred. The recoverability of capitalized insurance policy acquisition costs generally reflects anticipation of investment income. The unamortized balances are included in other assets and were approximately $3.25 billion and $2.95 billion at December 31, 2020 and 2019, respectively.

(s) Life and annuity insurance benefits

We compute liabilities for insurance benefits under life contracts based upon estimated future investment yields, expected mortality, morbidity and lapse or withdrawal rates, as well as estimates of premiums we expect to receive and expenses we expect to incur in the future. These assumptions, as applicable, also include a margin for adverse deviation and may vary with the characteristics of the contract's date of issuance, policy duration and country of risk. The interest rate assumptions used may vary by contract or jurisdiction. We discount periodic payment annuity liabilities based on the implicit rate as of the inception of the contracts such that the present value of the liabilities equals the premiums. Discount rates for most contracts range from 3% to 7%.

(t) Regulated utilities and energy businesses

Certain energy subsidiaries prepare their financial statements in accordance with authoritative guidance for regulated operations, reflecting the economic effects of regulation from the ability to recover certain costs from customers and the requirement to return revenues to customers in the future through the regulated rate-setting process. Accordingly, certain costs are deferred as regulatory assets and certain income is accrued as regulatory liabilities. Regulatory assets and liabilities will be amortized into operating expenses and revenues over various future periods.

Regulatory assets and liabilities are continually assessed for probable future inclusion in regulatory rates by considering factors such as applicable regulatory or legislative changes and recent rate orders received by other regulated entities. If future inclusion in regulatory rates ceases to be probable, the amount no longer probable of inclusion in regulatory rates is charged or credited to earnings (or other comprehensive income, if applicable) or returned to customers.

(u) Foreign currency

The accounts of our non-U.S. based subsidiaries are measured, in most instances, using functional currencies other than the U.S. Dollar. Revenues and expenses in the financial statements of these subsidiaries are translated into U.S. Dollars at the average exchange rate for the period and assets and liabilities are translated at the exchange rate as of the end of the reporting period. The net effects of translating the financial statements of these subsidiaries are included in shareholders' equity as a component of accumulated other comprehensive income. Gains and losses arising from transactions denominated in a currency other than the functional currency of the reporting entity, including gains and losses from the remeasurement of assets and liabilities due to changes in currency exchange rates, are included in earnings.

(v) Income taxes

Berkshire files a consolidated federal income tax return in the United States, which includes eligible subsidiaries. In addition, we file income tax returns in state, local and foreign jurisdictions as applicable. Provisions for current income tax liabilities are calculated and accrued on income and expense amounts expected to be included in the income tax returns for the current year. Income taxes reported in earnings also include deferred income tax provisions.

Deferred income tax assets and liabilities are computed on differences between the financial statement bases and tax bases of assets and liabilities at the enacted tax rates. Changes in deferred income tax assets and liabilities associated with components of other comprehensive income are charged or credited directly to other comprehensive income. Otherwise, changes in deferred income tax assets and liabilities are included as a component of income tax expense. The effect on deferred income tax assets and liabilities attributable to changes in enacted tax rates are charged or credited to income tax expense in the period of enactment. Valuation allowances are established for certain deferred tax assets when realization is not likely.

(1) Significant accounting policies and practices *(Continued)*

(v) Income taxes (Continued)

Assets and liabilities are established for uncertain tax positions taken or positions expected to be taken in income tax returns when such positions, in our judgment, do not meet a more-likely-than-not threshold based on the technical merits of the positions. Estimated interest and penalties related to uncertain tax positions are included as a component of income tax expense.

(w) New accounting pronouncements adopted in 2020

We adopted Accounting Standards Codification ("ASC") 326 "Financial Instruments-Credit Losses" on January 1, 2020. ASC 326 provides for the measurement of expected credit losses on financial assets that are carried at amortized cost based on the net amounts expected to be collected. Measurements of expected credit losses therefore include provisions for non-collection, whether the risk is probable or remote. Prior to the adoption of ASC 326, credit losses were measured when non-collection was considered probable based on the prevailing facts and circumstances. We do not measure an allowance for expected credit losses on accrued interest and instead, as permitted, we elected to reverse uncollectible accrued interest through interest income on a timely basis. Upon adoption of ASC 326, we recorded a charge to retained earnings of $388 million representing the cumulative after-tax increase in our allowances for credit losses, which was primarily related to our manufactured housing loans.

(x) New accounting pronouncements adopted in 2019

Berkshire adopted ASC 842 "Leases" on January 1, 2019. Most significantly, ASC 842 requires a lessee to recognize a liability to make operating lease payments and an asset with respect to its right to use the underlying asset for the lease term. In adopting and applying ASC 842, we elected to use practical expedients, including but not limited to, not reassessing past lease and easement accounting, not separating lease components from non-lease components by class of asset and not recording assets or liabilities for leases with terms of one year or less. We adopted ASC 842 as of January 1, 2019 with respect to contracts in effect as of that date and elected to not restate prior period financial statements.

Upon the adoption of ASC 842, we recognized operating lease right-of-use assets of approximately $6.2 billion and lease liabilities of $5.9 billion. We also reduced other assets by approximately $300 million. Consequently, our consolidated assets and liabilities increased by approximately $5.9 billion. ASC 842 did not have a material effect on our accounting for our lessor contracts or for lessee contracts classified as financing leases.

(y) New accounting pronouncements adopted in 2018

On January 1, 2018, we adopted Accounting Standards Update ("ASU") 2016-01 "Financial Instruments —Recognition and Measurement of Financial Assets and Financial Liabilities," ASU 2018-02 "Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income" and ASC 606 "Revenues from Contracts with Customers." Prior year financial statements were not restated. A summary of the effects of the initial adoption of ASU 2016-01, ASU 2018-02 and ASC 606 on our shareholders' equity follows (in millions).

	ASU 2016-01	ASU 2018-02	ASC 606	Total
Increase (decrease):				
Accumulated other comprehensive income	$ (61,459)	$ 84	$ —	$ (61,375)
Retained earnings	61,459	(84)	(70)	61,305
Shareholders' equity	—	—	(70)	(70)

In adopting ASU 2016-01, as of January 1, 2018, we reclassified the net after-tax unrealized gains on equity securities from accumulated other comprehensive income to retained earnings. Thereafter, the unrealized gains and losses from the changes during the period in the fair values of our equity securities are included within investment gains/losses in the Consolidated Statements of Earnings. In adopting ASU 2018-02, we reclassified certain deferred income tax effects as of January 1, 2018 attributable to the reduction in the U.S. statutory income tax rate under the Tax Cuts and Jobs Act of 2017 from accumulated other comprehensive income to retained earnings. In adopting ASC 606, we recorded increases to certain assets and other liabilities, with the cumulative net effect recorded to retained earnings.

(1) Significant accounting policies and practices *(Continued)*

(z) New accounting pronouncements to be adopted subsequent to December 31, 2020

In August 2018, the FASB issued ASU 2018-12 "Targeted Improvements to the Accounting for Long-Duration Contracts." ASU 2018-12 requires periodic reassessment of actuarial and discount rate assumptions used to value policyholder liabilities and deferred acquisition costs of long-duration insurance and reinsurance contracts, with the effects of changes in cash flow assumptions reflected in earnings and the effects of changes in discount rate assumptions reflected in other comprehensive income. Under current GAAP, the actuarial and discount rate assumptions are set at the contract inception date and not subsequently changed, except under limited circumstances. ASU 2018-12 requires new disclosures and is effective for fiscal years beginning after December 15, 2022, with early adoption permitted. We are evaluating the effect this standard will have on our Consolidated Financial Statements.

(2) Business acquisitions

Our long-held acquisition strategy is to acquire businesses that have consistent earning power, good returns on equity and able and honest management. Financial results attributable to business acquisitions are included in our Consolidated Financial Statements beginning on their respective acquisition dates.

In July 2020, Berkshire Hathaway Energy ("BHE") reached a definitive agreement with Dominion Energy, Inc. ("Dominion") to acquire substantially all of Dominion's natural gas transmission and storage business. On October 5, 2020, BHE and Dominion also agreed, as permitted under the acquisition agreement, to provide for the acquisition of all originally agreed upon businesses, except for certain pipeline assets (the "Excluded Assets") and entered into a second acquisition agreement with respect to the Excluded Assets. The acquisition of the Dominion businesses, other than the Excluded Assets, was completed on November 1, 2020 and included more than 5,400 miles of natural gas transmission, gathering and storage pipelines, about 420 billion cubic feet of operated natural gas storage capacity and partial ownership of a liquefied natural gas export, import and storage facility ("Cove Point"). Under the terms of the second acquisition agreement, BHE agreed to acquire the Excluded Assets for approximately $1.3 billion in cash. The closing of this second acquisition is subject to receiving necessary regulatory approvals and other customary closing conditions and is expected to occur during the first half of 2021.

The cost of the acquisition completed on November 1, 2020, was approximately $2.5 billion after post-closing adjustments as provided in the agreement. The preliminary fair values of identified assets acquired and liabilities assumed and residual goodwill are summarized as follows (in millions).

Property, plant and equipment	$	9,254
Goodwill		1,732
Other		2,376
Assets acquired	$	13,362
Notes payable and other borrowings	$	5,615
Other		1,317
Liabilities assumed		6,932
Noncontrolling interests		3,916
Net assets	$	2,514

As part of this acquisition, BHE acquired an indirect 25% economic interest in Cove Point, consisting of 100% of the general partnership interest and 25% of the limited partnership interests. We concluded that Cove Point is a VIE and that we have the power to direct the activities that most significantly impact its economic performance as well as the obligation to absorb losses and receive benefits which could be significant to Cove Point. Therefore, we treat Cove Point as a consolidated subsidiary. The noncontrolling interests in the preceding table is attributable to the limited partner interests held by third parties.

On October 1, 2018, we acquired MLMIC Insurance Company ("MLMIC"), a writer of medical professional liability insurance domiciled in New York. The acquisition price was approximately $2.5 billion. As of the acquisition date, the fair value of MLMIC's assets was approximately $6.1 billion, primarily investments ($5.2 billion), and the fair value of its liabilities was approximately $3.6 billion, primarily unpaid losses and loss adjustment expenses ($3.2 billion).

(2) Business acquisitions *(Continued)*

In each of the past three years, we also completed several smaller-sized business acquisitions, which we consider as "bolt-ons" to several of our existing business operations. Aggregate consideration paid for bolt-on acquisitions, net of cash acquired was approximately $130 million in 2020, $1.7 billion in 2019 and $1.0 billion in 2018. We do not believe that these acquisitions are material, individually or in the aggregate to our Consolidated Financial Statements.

(3) Investments in fixed maturity securities

Investments in fixed maturity securities as of December 31, 2020 and 2019 are summarized by type below (in millions).

	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
December 31, 2020				
U.S. Treasury, U.S. government corporations and agencies	$ 3,348	$ 55	$ —	$ 3,403
Foreign governments	11,233	110	(5)	11,338
Corporate bonds	4,729	464	(2)	5,191
Other	414	66	(2)	478
	$ 19,724	$ 695	$ (9)	$ 20,410
December 31, 2019				
U.S. Treasury, U.S. government corporations and agencies	$ 3,054	$ 37	$ (1)	$ 3,090
Foreign governments	8,584	63	(9)	8,638
Corporate bonds	5,896	459	(3)	6,352
Other	539	67	(1)	605
	$ 18,073	$ 626	$ (14)	$ 18,685

Investments in foreign governments include securities issued by national and provincial government entities as well as instruments that are unconditionally guaranteed by such entities. As of December 31, 2020, approximately 88% of our foreign government holdings were rated AA or higher by at least one of the major rating agencies.

The amortized cost and estimated fair value of fixed maturity securities at December 31, 2020 are summarized below by contractual maturity dates. Amounts are in millions. Actual maturities may differ from contractual maturities due to early call or prepayment rights held by issuers.

	Due in one year or less	Due after one year through five years	Due after five years through ten years	Due after ten years	Mortgage-backed securities	Total
Amortized cost	$ 10,379	$ 8,323	$ 373	$ 337	$ 312	$19,724
Fair value	10,448	8,456	496	640	370	20,410

(4) Investments in equity securities

Investments in equity securities as of December 31, 2020 and 2019 are summarized based on the primary industry of the investee in the table below (in millions).

	Cost Basis	Net Unrealized Gains	Fair Value
December 31, 2020 *			
Banks, insurance and finance	$ 26,312	$ 40,167	$ 66,479
Consumer products	34,747	111,583	146,330
Commercial, industrial and other	47,561	20,800	68,361
	$ 108,620	$ 172,550	$ 281,170

* *Approximately 68% of the aggregate fair value was concentrated in four companies (American Express Company – $18.3 billion; Apple Inc. – $120.4 billion; Bank of America Corporation – $31.3 billion and The Coca-Cola Company – $21.9 billion).*

	Cost Basis	Net Unrealized Gains	Fair Value
December 31, 2019 *			
Banks, insurance and finance	$ 40,419	$ 61,976	$ 102,395
Consumer products	38,887	60,747	99,634
Commercial, industrial and other	31,034	14,964	45,998
	$ 110,340	$ 137,687	$ 248,027

* *Approximately 60% of the aggregate fair value was concentrated in four companies (American Express Company – $18.9 billion; Apple Inc. – $73.7 billion; Bank of America Corporation – $33.4 billion and The Coca-Cola Company – $22.1 billion).*

On August 8, 2019, Berkshire invested a total of $10 billion in Occidental Corporation ("Occidental") newly issued Occidental Cumulative Perpetual Preferred Stock with an aggregate liquidation value of $10 billion and warrants to purchase up to 80 million shares of Occidental common stock at an exercise price of $62.50 per share. In accordance with the terms of the warrants, on August 3, 2020, the number of shares of common stock that can be purchased was increased to 83.86 million shares and the exercise price was reduced to $59.62 per share. The preferred stock accrues dividends at 8% per annum and is redeemable at the option of Occidental commencing in 2029 at a redemption price equal to 105% of the liquidation preference plus any accumulated and unpaid dividends, or is mandatorily redeemable under certain specified capital return events. Dividends on the preferred stock may be paid in cash or, at Occidental's option, in shares of Occidental common stock. The warrants are exercisable in whole or in part until one year after the redemption of the preferred stock. Our investments in Occidental are included in the commercial, industrial and other category in the preceding tables.

(5) Equity method investments

Berkshire and its subsidiaries hold investments in certain businesses that are accounted for pursuant to the equity method. Currently, the most significant of these is our investment in the common stock of The Kraft Heinz Company ("Kraft Heinz"). Kraft Heinz is one of the world's largest manufacturers and marketers of food and beverage products, including condiments and sauces, cheese and dairy, meals, meats, refreshment beverages, coffee and other grocery products. Berkshire currently owns 325,442,152 shares of Kraft Heinz common stock representing 26.6% of the outstanding shares.

(5) Equity method investments *(Continued)*

We recorded equity method earnings from our investment in Kraft Heinz of $95 million in 2020, $493 million in 2019 and losses of approximately $2.7 billion in 2018. Equity method earnings (losses) included the effects of goodwill and identifiable intangible asset impairment charges recorded by Kraft Heinz. Our share of such charges was approximately $850 million in 2020, $450 million in 2019 and $3.7 billion in 2018. We received dividends from Kraft Heinz of $521 million in each of 2020 and 2019 and $814 million in 2018, which we recorded as reductions in our carrying value.

Shares of Kraft Heinz common stock are publicly-traded and the fair value of our investment was approximately $11.3 billion at December 31, 2020 and $10.5 billion at December 31, 2019. The carrying value of our investment was approximately $13.3 billion at December 31, 2020 and $13.8 billion at December 31, 2019. As of December 31, 2020, the carrying value of our investment exceeded the fair value based on the quoted market price by $2.0 billion (15% of carrying value). In light of this fact, we evaluated our investment in Kraft Heinz for impairment. We utilize no bright-line tests in such evaluations. Based on the available facts and information regarding the operating results of Kraft Heinz, our ability and intent to hold the investment until recovery, the relative amount of the decline and the length of time that fair value was less than carrying value, we concluded that recognition of an impairment loss in earnings was not required. However, we will continue to monitor this investment and it is possible that an impairment loss will be recorded in earnings in a future period based on changes in facts and circumstances or intentions.

Summarized financial information of Kraft Heinz follows (in millions).

	December 26, 2020	December 28, 2019
Assets	$ 99,830	$ 101,450
Liabilities	49,587	49,701

	Year ending December 26, 2020	Year ending December 28, 2019	Year ending December 29, 2018
Sales	$ 26,185	$ 24,977	$ 26,268
Net earnings (losses) attributable to Kraft Heinz common shareholders	$ 356	$ 1,935	$ (10,192)

Other investments accounted for pursuant to the equity method include our investments in Berkadia Commercial Mortgage LLC ("Berkadia"), Pilot Travel Centers LLC ("Pilot") and Electric Transmission Texas, LLC ("ETT"). The carrying value of our investments in these entities was approximately $4.0 billion as of December 31, 2020 and $3.7 billion as of December 31, 2019. Our equity method earnings in these entities were $631 million in 2020, $683 million in 2019 and $563 million in 2018. Additional information concerning these investments follows.

We own a 50% interest in Berkadia, with Jefferies Financial Group Inc. ("Jefferies") owning the other 50% interest. Berkadia is a servicer of commercial real estate loans in the U.S., performing primary, master and special servicing functions for U.S. government agency programs, commercial mortgage-backed securities transactions, banks, insurance companies and other financial institutions. A source of funding for Berkadia's operations is through its issuance of commercial paper, which is currently limited to $1.5 billion. On December 31, 2020, Berkadia's commercial paper outstanding was $1.47 billion. The commercial paper is supported by a surety policy issued by a Berkshire insurance subsidiary. Jefferies is obligated to indemnify us for one-half of any losses incurred under the policy.

A Berkshire Hathaway Energy Company subsidiary owns a 50% interest in ETT, an owner and operator of electric transmission assets in the Electric Reliability Council of Texas footprint. American Electric Power owns the other 50% interest.

On October 3, 2017, we entered into an investment agreement and an equity purchase agreement whereby we acquired a 38.6% interest in Pilot, headquartered in Knoxville, Tennessee. Pilot is the largest operator of travel centers in North America, supplying more than 11 billion gallons of fuel per year via more than 950 retail locations across 44 U.S. states and six Canadian provinces and through wholesale distribution. The Haslam family currently owns a 50.1% interest in Pilot and a third party owns the remaining 11.3% interest. We also entered into an agreement to acquire in 2023 an additional 41.4% interest in Pilot with the Haslam family retaining a 20% interest. As a result, Berkshire will become the majority owner of Pilot in 2023.

(6) Investment gains/losses

Investment gains/losses for each of the three years ending December 31, 2020 are summarized below (in millions).

	2020	2019	2018
Equity securities:			
Change in unrealized investment gains/losses during the year on securities held at the end of the period	$ 54,951	$ 69,581	$ (22,729)
Investment gains/losses during the year on securities sold	(14,036)	1,585	291
	40,915	71,166	(22,438)
Fixed maturity securities:			
Gross realized gains	56	87	480
Gross realized losses	(27)	(25)	(227)
Other	(39)	(105)	30
	$ 40,905	$ 71,123	$ (22,155)

Equity securities gains and losses include unrealized gains and losses from changes in fair values during the period on equity securities we still own, as well as gains and losses on securities we sold during the period. As reflected in the Consolidated Statements of Cash Flows, we received proceeds of approximately $38.8 billion in 2020, $14.3 billion in 2019 and $18.8 billion in 2018 from sales of equity securities. In the preceding table, investment gains/losses on equity securities sold reflect the difference between proceeds from sales and the fair value of the equity security sold at the beginning of the period or the purchase date, if later. Our taxable gains on equity securities sold during the year, which are generally the difference between the proceeds from sales and our original cost, were $6.2 billion in 2020, $3.2 billion in 2019 and $3.3 billion in 2018.

(7) Loans and finance receivables

Loans and finance receivables are summarized as follows (in millions).

	December 31, 2020	December 31, 2019
Loans and finance receivables before allowances and discounts	$ 20,436	$ 18,199
Allowances for uncollectible loans	(712)	(167)
Unamortized acquisition discounts and points	(523)	(505)
	$ 19,201	$ 17,527

Loans and finance receivables are principally manufactured home loans, and to a lesser extent, commercial loans and site-built home loans. Reconciliations of the allowance for credit losses on loans and finance receivables for 2020 and 2019 follow (in millions).

	2020	2019
Balance at beginning of year	$ 167	$ 177
Adoption of ASC 326	486	—
Provision for credit losses	177	125
Charge-offs, net of recoveries	(118)	(135)
Balance at December 31	$ 712	$ 167

At December 31, 2020, approximately 99% of home loan balances were evaluated collectively for impairment. At December 31, 2020, we considered approximately 97% of the loan balances to be current as to payment status. A summary of performing and non-performing home loans before discounts and allowances by year of loan origination as of December 31, 2020 follows (in millions).

	Loans and Financing Receivables by Origination Year						
	2020	2019	2018	2017	2016	Prior	Total

Performing	$ 4,430	$ 2,537	$ 1,928	$ 1,424	$ 1,276	$ 6,645	$ 18,240
Non-performing	3	5	7	7	7	43	72
Total	$ 4,433	$ 2,542	$ 1,935	$ 1,431	$ 1,283	$ 6,688	$ 18,312

(7) Loans and finance receivables *(Continued)*

We are party to an agreement with Seritage Growth Properties to provide a $2.0 billion term loan facility, which expires on July 31, 2023. The outstanding loan under the facility was approximately $1.6 billion at December 31, 2020 and 2019, and is secured by mortgages on real estate properties. In 2020, we provided a loan to Lee Enterprises, Inc. in connection with its acquisition of our newspaper operations and the repayment by Lee of its then outstanding credit facilities. The loan balance as of December 31, 2020 was $524 million. We are the sole lender to each of these entities and each of these loans is current as to payment status.

(8) Other receivables

Other receivables of insurance and other businesses are comprised of the following (in millions).

	December 31,	
	2020	2019
Insurance premiums receivable	$ 14,025	$ 13,379
Reinsurance recoverables	4,805	4,470
Trade receivables	11,521	12,275
Other	2,637	2,712
Allowances for uncollectible accounts	(678)	(418)
	$ 32,310	$ 32,418

Receivables of our railroad and utilities and energy businesses are comprised of the following (in millions).

	December 31,	
	2020	2019
Trade receivables	$ 3,235	$ 3,120
Other	438	388
Allowances for uncollectible accounts	(131)	(91)
	$ 3,542	$ 3,417

Provisions for credit losses on receivables in the preceding tables were $564 million in 2020 and $363 million in 2019. Net charge-offs were $401 million in 2020 and $350 million in 2019.

(9) Inventories

Inventories are comprised of the following (in millions).

	December 31,	
	2020	2019
Raw materials	$ 4,821	$ 4,492
Work in process and other	2,541	2,700
Finished manufactured goods	4,412	4,821
Goods acquired for resale	7,434	7,839
	$ 19,208	$ 19,852

(10) Property, plant and equipment

A summary of property, plant and equipment of our insurance and other businesses follows (in millions).

	December 31,	
	2020	2019

Land, buildings and improvements	$ 13,799	$ 13,259
Machinery and equipment	25,488	24,285
Furniture, fixtures and other	4,530	4,666
	43,817	42,210
Accumulated depreciation	(22,617)	(20,772)
	$ 21,200	$ 21,438

(10) Property, plant and equipment *(Continued)*

A summary of property, plant and equipment of railroad and utilities and energy businesses follows (in millions). The utility generation, transmission and distribution systems and interstate natural gas pipeline assets are owned by regulated public utility and natural gas pipeline subsidiaries.

	December 31, 2020	December 31, 2019
Railroad:		
Land, track structure and other roadway	$ 63,824	$ 62,404
Locomotives, freight cars and other equipment	13,523	13,482
Construction in progress	916	748
	78,263	76,634
Accumulated depreciation	(13,175)	(12,101)
	65,088	64,533
Utilities and energy:		
Utility generation, transmission and distribution systems	86,730	81,127
Interstate natural gas pipeline assets	16,667	8,165
Independent power plants and other assets	12,671	8,817
Construction in progress	3,308	3,732
	119,376	101,841
Accumulated depreciation	(33,248)	(28,536)
	86,128	73,305
	$ 151,216	$ 137,838

Depreciation expense for each of the three years ending December 31, 2020 is summarized below (in millions).

	2020	2019	2018
Insurance and other	$ 2,320	$ 2,269	$ 2,186
Railroad, utilities and energy	5,799	5,297	5,098
	$ 8,119	$ 7,566	$ 7,284

(11) Equipment held for lease

Equipment held for lease includes railcars, aircraft, over-the-road trailers, intermodal tank containers, cranes, storage units and furniture. Equipment held for lease is summarized below (in millions).

	December 31, 2020	December 31, 2019
Railcars	$ 9,402	$ 9,260
Aircraft	8,204	8,093
Other	4,868	4,862
	22,474	22,215
Accumulated depreciation	(7,873)	(7,150)
	$ 14,601	$ 15,065

Depreciation expense for equipment held for lease was $1,200 million in 2020, $1,181 million in 2019 and $1,102 million in 2018. Fixed and variable operating lease revenues for each of the two years ending December 31, 2020 are summarized below (in millions).

	2020	2019
Fixed lease revenue	$ 4,262	$ 4,415
Variable lease revenue	947	1,441

	$ 5,209	$ 5,856

(11) Equipment held for lease *(Continued)*

A summary of future operating lease receipts as of December 31, 2020 follows (in millions).

2021	2022	2023	2024	2025	Thereafter	Total
$ 2,618	$ 1,962	$ 1,429	$ 905	$ 443	$ 387	$ 7,744

(12) Leases

We are party to contracts where we lease property from others. As a lessee, we primarily lease office and operating facilities, locomotives, freight cars, energy generation facilities and transmission assets. Operating lease right-of-use assets were $5,579 million and lease liabilities were $5,469 million at December 31, 2020. Operating lease right-of-use assets were $5,941 million and lease liabilities were $5,882 million at December 31, 2019. Such amounts were included in other assets and accounts payable, accruals and other liabilities in our Consolidated Balance Sheet. The weighted average term of these leases was approximately 7.3 years at December 31, 2020 and 7.7 years at December 31, 2019. The weighted average discount rate used to measure lease liabilities was approximately 3.6% at December 31, 2020 and 3.8% at December 31, 2019. A summary of our remaining operating lease payments as of December 31, 2020 and December 31, 2019 follows (in millions).

	Year 1	Year 2	Year 3	Year 4	Year 5	Thereafter	Total lease payments	Amount representing interest	Lease liabilities
December 31:									
2020	$ 1,342	$ 1,111	$ 905	$ 725	$ 544	$ 1,691	$ 6,318	$ (849)	$ 5,469
2019	1,374	1,183	950	764	620	1,988	6,879	(997)	5,882

Components of operating lease costs for the years ending December 31, 2020 and 2019, by type, are summarized in the following table (in millions). Operating lease expense was $1,649 million in 2018.

	2020	2019
Operating lease cost	$ 1,413	$ 1,459
Short-term lease cost	145	178
Variable lease cost	228	276
Sublease income	(10)	(24)
Total lease cost	$ 1,776	$ 1,889

(13) Goodwill and other intangible assets

Reconciliations of the changes in the carrying value of goodwill during 2020 and 2019 follows (in millions).

	December 31, 2020	December 31, 2019
Balance at beginning of year	$ 81,882	$ 81,025
Acquisitions of businesses	1,758	890
Impairment charges	(10,033)	(90)
Other, including foreign currency translation	127	57
Balance at end of year*	$ 73,734	$ 81,882

* *Net of accumulated goodwill impairments of $11.0 billion as of December 31, 2020 and $1.1 billion as of December 31, 2019.*

(13) Goodwill and other intangible assets *(Continued)*

The gross carrying amounts and related accumulated amortization of other intangible assets are summarized as follows (in millions).

	December 31, 2020		December 31, 2019	
	Gross carrying amount	Accumulated amortization	Gross carrying amount	Accumulated amortization
Insurance and other:				
Customer relationships	$ 27,374	$ 5,756	$ 27,943	$ 5,025
Trademarks and trade names	5,206	779	5,286	759
Patents and technology	4,766	3,313	4,560	3,032
Other	3,339	1,375	3,364	1,286
	$ 40,685	$ 11,223	$ 41,153	$ 10,102
Railroad, utilities and energy:				
Customer relationships	$ 678	$ 361	$ 678	$ 324
Trademarks, trade names and other	1,003	98	325	84
	$ 1,681	$ 459	$ 1,003	$ 408

Intangible asset amortization expense was $1,277 million in 2020, $1,317 million in 2019 and $1,393 million in 2018. Estimated amortization expense over the next five years is as follows (in millions): 2021 – $1,262; 2022 – $1,190; 2023 – $1,108; 2024 – $986 and 2025 – $906. Intangible assets with indefinite lives were $18.3 billion as of December 31, 2020 and $19.0 billion as of December 31, 2019 and primarily related to certain customer relationships and trademarks and trade names.

During 2020, we concluded it was necessary to reevaluate goodwill and indefinite-lived intangible assets of certain of our reporting units for impairment due to the disruptions arising from the COVID-19 pandemic. We believed that the most significant of these disruptions related to the air travel and commercial aerospace and supporting industries. We recorded pre-tax goodwill impairment charges of approximately $10 billion and pre-tax indefinite-lived intangible asset impairment charges of $638 million in the second quarter of 2020. Approximately $10 billion of these charges related to Precision Castparts Corp. ("PCC"), the largest business within Berkshire's manufacturing segment. The carrying value of PCC-related goodwill and indefinite-lived intangible assets prior to the impairment charges was approximately $31 billion.

The impairment charges were determined based on discounted cash flow methods and reflected our assessments of the risks and uncertainties associated with the aerospace industry. Significant judgment is required in estimating the fair value of a reporting unit and in performing impairment tests. Due to the inherent uncertainty in forecasting cash flows and earnings, actual results in the future may vary significantly from the forecasts.

(14) Derivative contracts

We are party to derivative contracts through certain of our subsidiaries. The most significant derivative contracts consist of equity index put option contracts. Information related to these contracts follows (dollars in millions).

	December 31,	
	2020	2019
Balance sheet liabilities - at fair value	$ 1,065	$ 968
Notional value	10,991	14,385
Intrinsic value	727	397
Weighted average remaining life (in years)	1.2	1.8

The equity index put option contracts are European style options written prior to March 2008 on four major equity indexes. Notional value in the preceding table represents the aggregate undiscounted amounts payable assuming that the value of each index is zero at each contract's expiration date. Intrinsic value is the undiscounted liability assuming the contracts are settled based on the index values and foreign currency exchange rates as of the balance sheet date. Substantially all open contracts as of December 31, 2020 will expire by February 2023.

(14) Derivative contracts *(Continued)*

Future payments, if any, under any given contract will be required if the prevailing index value is below the contract strike price at the expiration date. We received aggregate premiums of $1.9 billion on the contract inception dates with respect to unexpired contracts as of December 31, 2020 and we have no counterparty credit risk.

We recorded derivative contract losses of $159 million in 2020, gains of $1,484 million in 2019 and losses of $300 million in 2018, with respect to our equity index put option contracts. These gains and losses were primarily due to changes in the equity index values. These contracts may not be unilaterally terminated or fully settled before the expiration dates and the ultimate amount of cash basis gains or losses on these contracts will not be determined until the contract expiration dates.

Our regulated utility subsidiaries may use forward purchases and sales, futures, swaps and options to manage a portion of their commodity price risks. Most of these net derivative contract assets or liabilities of our regulated utilities are probable of recovery through rates and are offset by regulatory liabilities or assets.

(15) Unpaid losses and loss adjustment expenses

Our liabilities for unpaid losses and loss adjustment expenses (also referred to as "claim liabilities") under property and casualty insurance and reinsurance contracts are based upon estimates of the ultimate claim costs associated with claim occurrences as of the balance sheet date and include estimates for incurred-but-not-reported ("IBNR") claims. A reconciliation of the changes in claim liabilities, excluding liabilities under retroactive reinsurance contracts (see Note 16), for each of the three years ending December 31, 2020 is as follows (in millions).

	2020	2019	2018
Balances at beginning of year:			
Gross liabilities	$ 73,019	$ 68,458	$ 61,122
Reinsurance recoverable on unpaid losses	(2,855)	(3,060)	(3,201)
Net liabilities	70,164	65,398	57,921
Incurred losses and loss adjustment expenses:			
Current accident year events	43,400	43,335	39,876
Prior accident years' events	(356)	(752)	(1,406)
Total	43,044	42,583	38,470
Paid losses and loss adjustment expenses:			
Current accident year events	(17,884)	(19,482)	(18,391)
Prior accident years' events	(18,862)	(17,642)	(15,452)
Total	(36,746)	(37,124)	(33,843)
Foreign currency translation adjustment	480	(23)	(331)
Business acquisition (disposition)	—	(670)	3,181
Balances at December 31:			
Net liabilities	76,942	70,164	65,398
Reinsurance recoverable on unpaid losses	2,912	2,855	3,060
Gross liabilities	$ 79,854	$ 73,019	$ 68,458

Incurred losses and loss adjustment expenses shown in the preceding table were recorded in earnings and related to insured events occurring in the current year ("current accident year") and events occurring in all prior years ("prior accident years"). Current accident year losses included approximately $950 million in 2020, $1.0 billion in 2019 and $1.6 billion in 2018 from significant catastrophe events occurring in each year. Current accident year losses in 2020 also reflected the effects of low private passenger automobile claims frequencies and increased loss estimates for certain commercial insurance and reinsurance business attributable to the COVID-19 pandemic.

We recorded net reductions of estimated ultimate liabilities for prior accident years of $356 million in 2020, $752 million in 2019 and $1,406 million in 2018, which produced corresponding reductions in incurred losses and loss adjustment expenses. These reductions, as percentages of the net liabilities at the beginning of each year, were 0.5% in 2020, 1.1% in 2019 and 2.4% in 2018.

(15) Unpaid losses and loss adjustment expenses *(Continued)*

Estimated ultimate liabilities for prior years' loss events related to primary insurance were reduced by $518 million in 2020, $457 million in 2019 and $937 million in 2018. The decrease in 2020 was primarily attributable to reductions for private passenger automobile, medical professional liability and workers' compensation claims, partly offset by increases for other casualty claims. The decrease in 2019 reflected reductions in medical professional liability and workers' compensation claims, partially offset by higher commercial auto and other liability claims. The decrease in 2018 was primarily due to reductions for workers' compensation, medical professional liability and private passenger automobile claims. Estimated ultimate liabilities for prior years' loss events related to property and casualty reinsurance increased $162 million in 2020 and were reduced $295 million in 2019 and $469 million in 2018. The increase in 2020 included increased claims estimates for legacy casualty exposures.

Estimated claim liabilities included amounts for environmental, asbestos and other latent injury exposures, net of reinsurance recoverable, of approximately $2.1 billion at December 31, 2020 and $1.7 billion at December 31, 2019. These liabilities are subject to change due to changes in the legal and regulatory environment. We are unable to reliably estimate additional losses or a range of losses that are reasonably possible for these claims.

Disaggregated information concerning our claims liabilities is provided below and in the pages that follow. The effects of businesses acquired or disposed during the period are reflected in the data presented on a retrospective basis. A reconciliation of the disaggregated net unpaid losses and allocated loss adjustment expenses (the latter referred to as "ALAE") of GEICO, Berkshire Hathaway Primary Group ("BH Primary") and Berkshire Hathaway Reinsurance Group ("BHRG") to our consolidated unpaid losses and loss adjustment expenses as of December 31, 2020 follows (in millions).

	GEICO Physical Damage	GEICO Auto Liability	BH Primary Medical Professional Liability	BH Primary Workers' Compensation and Other Casualty	BHRG Property	BHRG Casualty	Total
Unpaid losses and ALAE, net	$ 524	$ 18,755	$ 7,897	$ 11,294	$ 11,280	$ 22,890	$ 72,640
Reinsurance recoverable	—	1,109	49	621	181	864	2,824
Unpaid unallocated loss adjustment expenses							2,671
Other unpaid losses and loss adjustment expenses							1,719
Unpaid losses and loss adjustment expenses							$ 79,854

GEICO

GEICO's claim liabilities predominantly relate to various types of private passenger auto liability and physical damage claims. For such claims, we establish and evaluate unpaid claim liabilities using standard actuarial loss development methods and techniques. The actuarial methods utilize historical claims data, adjusted when deemed appropriate to reflect perceived changes in loss patterns. Claim liabilities include average, case, case development and IBNR estimates.

We establish average liabilities based on expected severities for newly reported physical damage and liability claims prior to establishing individual case reserves when insufficient time or information is available for specific claim estimates and for large volumes of minor physical damage claims that once reported are quickly settled. We establish case loss estimates for liability claims, including estimates for loss adjustment expenses, as the facts and merits of the claim are evaluated.

Estimates for liability coverages are more uncertain than for physical damage coverages, primarily due to the longer claim-tails, the greater chance of protracted litigation and the incompleteness of facts at the time the case estimate is first established. The "claim-tail" is the time period between the claim occurrence date and settlement date. Consequently, we establish additional case development liabilities, which are usually percentages of the case liabilities. For unreported claims, IBNR liabilities are estimated by projecting the ultimate number of claims expected (reported and unreported) for each significant coverage and deducting reported claims to produce estimated unreported claims. The product of the average cost per unreported claim and the number of unreported claims produces the IBNR liability estimate. We may record supplemental IBNR liabilities in certain situations when actuarial techniques are difficult to apply.

(15) Unpaid losses and loss adjustment expenses *(Continued)*

GEICO's incurred and paid losses and ALAE, net of reinsurance, are summarized by accident year below for physical damage and auto liability claims. IBNR and case development liabilities are as of December 31, 2020. Claim counts are established when accidents that may result in a liability are reported and are based on policy coverage. Each claim event may generate claims under multiple coverages, and thus may result in multiple counts. The "Cumulative Number of Reported Claims" includes the combined number of reported claims for all policy coverages and excludes projected IBNR claims. Dollars are in millions.

Physical Damage

	Incurred Losses and ALAE through December 31,			
Accident Year	**2019***	**2020**	**IBNR and Case Development Liabilities**	**Cumulative Number of Reported Claims (in thousands)**
2019	$ 9,020	$ 8,920	$ 69	8,929
2020		8,603	296	7,794
Incurred losses and ALAE		$ 17,523		

	Cumulative Paid Losses and ALAE through December 31,	
Accident Year	**2019***	**2020**
2019	$ 8,678	$ 8,905
2020		8,118
Paid losses and ALAE		17,023
Net unpaid losses and ALAE for 2019 – 2020 accident years		500
Net unpaid losses and ALAE for accident years before 2019		24
Net unpaid losses and ALAE		$ 524

Auto Liability

	Incurred Losses and ALAE through December 31,						
Accident Year	**2016***	**2017***	**2018***	**2019***	**2020**	**IBNR and Case Development Liabilities**	**Cumulative Number of Reported Claims (in thousands)**
2016	$ 11,800	$ 12,184	$ 12,149	$ 12,178	$ 12,198	$ 222	2,451
2017		14,095	13,864	13,888	13,824	502	2,639
2018			15,383	15,226	14,985	1,163	2,702
2019				16,901	16,678	2,905	2,749
2020					14,637	4,482	1,945
Incurred losses and ALAE					$ 72,322		

	Cumulative Paid Losses and ALAE through December 31,				
Accident Year	**2016***	**2017***	**2018***	**2019***	**2020**
2016	$ 5,069	$ 8,716	$ 10,330	$ 11,294	$ 11,718
2017		5,806	9,944	11,799	12,729
2018			6,218	10,772	12,658
2019				6,742	11,671
2020					5,395
Paid losses and ALAE					54,171
Net unpaid losses and ALAE for 2016 – 2020 accident years					18,151
Net unpaid losses and ALAE for accident years before 2016					604
Net unpaid losses and ALAE					$ 18,755

* *Unaudited required supplemental information*

Notes to Consolidated Financial Statements *(Continued)*

(15) Unpaid losses and loss adjustment expenses *(Continued)*

BH Primary

BH Primary's liabilities for unpaid losses and loss adjustment expenses primarily derive from medical professional liability and workers' compensation and other casualty insurance, including commercial auto and general liability insurance. Incurred and paid losses and ALAE are summarized by accident year in the following tables, disaggregated by medical professional liability coverages and workers' compensation and other casualty coverages. IBNR and case development liabilities are as of December 31, 2020. The cumulative number of reported claims reflects the number of individual claimants and includes claims that ultimately resulted in no liability or payment. Dollars are in millions.

BH Primary Medical Professional Liability

We estimate the ultimate expected incurred losses and loss adjustment expenses for medical professional claim liabilities using a variety of commonly accepted actuarial methodologies, such as the paid and incurred development method and Bornhuetter-Ferguson based methods, as well as other techniques that consider insured loss exposures and historical and expected loss trends, among other factors. These methodologies produce loss estimates from which we determine our best estimate. In addition, we study developments in older accident years and adjust initial loss estimates to reflect recent development based upon claim age, coverage and litigation experience.

	Incurred Losses and ALAE through December 31,											
Accident Year	**2011***	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019***	**2020**	**IBNR and Case Development Liabilities**	**Cumulative Number of Reported Claims (in thousands)**
2011	$1,346	$1,334	$1,321	$1,262	$1,173	$1,115	$1,050	$1,004	$ 968	$ 972	$ 39	11
2012		1,336	1,306	1,277	1,223	1,168	1,078	1,035	998	988	53	11
2013			1,328	1,296	1,261	1,195	1,127	1,086	1,019	985	65	11
2014				1,370	1,375	1,305	1,246	1,218	1,127	1,061	129	11
2015					1,374	1,342	1,269	1,290	1,218	1,157	202	12
2016						1,392	1,416	1,414	1,394	1,341	286	14
2017							1,466	1,499	1,495	1,474	494	20
2018								1,602	1,650	1,659	780	22
2019									1,670	1,691	1,204	17
2020										1,704	1,529	13
									Incurred losses and ALAE	$13,032		

	Cumulative Paid Losses and ALAE through December 31,									
Accident Year	**2011***	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019***	**2020**
2011	$ 16	$ 82	$ 200	$ 356	$ 517	$ 632	$ 711	$ 767	$ 822	$ 842
2012		15	93	218	377	522	642	725	789	830
2013			15	90	219	368	518	635	743	793
2014				21	106	238	396	540	671	752
2015					23	108	218	382	543	663
2016						22	115	274	461	620
2017							27	128	300	457
2018								35	166	367
2019									39	160
2020										34
									Paid losses and ALAE	5,518
									Net unpaid losses and ALAE for 2011– 2020 accident years	7,514
									Net unpaid losses and ALAE for accident years before 2011	383
									Net unpaid losses and ALAE	$ 7,897

* *Unaudited required supplemental information*

(15) Unpaid losses and loss adjustment expenses *(Continued)*

BH Primary Workers' Compensation and Other Casualty

We periodically evaluate ultimate loss and loss adjustment expense estimates for the workers' compensation and other casualty claims using a combination of commonly accepted actuarial methodologies such as the Bornhuetter-Ferguson and chain-ladder approaches using paid and incurred loss data. Paid and incurred loss data is segregated and analyzed by state due to the different state regulatory frameworks that may impact certain factors, including the duration and amount of loss payments. We also separately study the various components of liabilities, such as employee lost wages, medical expenses and the costs of claims investigations and administration. We establish case liabilities for reported claims based upon the facts and circumstances of the claim. The excess of the ultimate projected losses, including the expected development of case estimates, and the case-basis liabilities is included in IBNR liabilities.

	Incurred Losses and ALAE through December 31,											
Accident Year	**2011***	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019***	**2020**	**IBNR and Expected Development Liabilities**	**Cumulative Number of Reported Claims (in thousands)**
2011	$ 738	$ 675	$ 675	$ 624	$ 621	$ 618	$ 607	$ 596	$ 591	$ 576	$ 39	46
2012		873	850	837	791	780	762	750	736	718	53	53
2013			1,258	1,228	1,178	1,127	1,096	1,072	1,050	1,028	120	67
2014				1,743	1,638	1,614	1,548	1,482	1,497	1,477	190	90
2015					2,169	2,127	2,042	2,014	2,025	1,997	267	111
2016						2,511	2,422	2,359	2,325	2,365	470	115
2017							3,044	2,907	2,842	2,843	691	138
2018								3,544	3,412	3,480	1,152	160
2019									4,074	4,102	1,788	170
2020										4,421	2,987	120
									Incurred losses and ALAE	$23,007		

	Cumulative Paid Losses and ALAE through December 31,									
Accident Year	**2011***	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019***	**2020**
2011	$ 109	$ 220	$ 333	$ 403	$ 453	$ 481	$ 496	$ 505	$ 512	$ 519
2012		116	299	414	501	560	592	611	626	634
2013			177	422	609	725	793	835	858	874
2014				239	557	800	1,007	1,111	1,176	1,214
2015					289	700	1,017	1,289	1,488	1,570
2016						329	775	1,148	1,461	1,661
2017							441	1,003	1,434	1,771
2018								538	1,198	1,683
2019									682	1,478
2020										695
									Paid losses and ALAE	12,099
									Net unpaid losses and ALAE for 2011 – 2020 accident years	10,908
									Net unpaid losses and ALAE for accident years before 2011	386
									Net unpaid losses and ALAE	$11,294

* *Unaudited required supplemental information*

BHRG

We use a variety of methodologies to establish BHRG's estimates for property and casualty claims liabilities. We use certain methodologies, such as paid and incurred loss development techniques, incurred and paid loss Bornhuetter-Ferguson techniques and frequency and severity techniques, as well as ground-up techniques when appropriate.

Our claims liabilities are principally a function of reported losses from ceding companies, case development and IBNR liability estimates. Case loss estimates are reported under our contracts either individually or in bulk as provided under the terms of the contracts. We may independently evaluate case losses reported by the ceding company, and if deemed appropriate, we may establish case liabilities based on our estimates.

(15) Unpaid losses and loss adjustment expenses *(Continued)*

Estimated IBNR liabilities are affected by expected case loss emergence patterns and expected loss ratios, which are evaluated as groups of contracts with similar exposures or on a contract-by-contract basis. Estimated case and IBNR liabilities for major catastrophe events are generally based on a per-contract assessment of the ultimate cost associated with the individual loss event. Claim count data is not provided consistently by ceding companies under our contracts or is otherwise considered unreliable.

Incurred and paid losses and ALAE of BHRG are disaggregated based on losses that are expected to have shorter claim-tails (property) and losses expected to have longer claim-tails (casualty). Under certain contracts, the coverage can apply to multiple lines of business written by the ceding company, whether property, casualty or combined, and the ceding company may not report loss data by such lines consistently, if at all. In those instances, we allocated losses to property and casualty coverages based on internal estimates. BHRG's disaggregated incurred and paid losses and ALAE are summarized by accident year, net of reinsurance. IBNR and case development liabilities are as of December 31, 2020. Dollars are in millions.

BHRG Property

Incurred Losses and ALAE through December 31,

Accident Year	2011*	2012*	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020	IBNR and Case Development Liabilities
2011	$ 4,111	$ 4,095	$ 3,804	$ 3,711	$ 3,707	$ 3,672	$ 3,654	$ 3,638	$ 3,627	$ 3,616	$ 30
2012		3,153	2,846	2,644	2,403	2,351	2,348	2,329	2,315	2,305	35
2013			3,255	3,093	2,745	2,653	2,631	2,570	2,518	2,504	45
2014				2,648	2,436	2,322	2,178	2,123	2,050	2,021	48
2015					3,287	3,135	2,577	2,979	2,976	3,000	143
2016						3,293	3,923	3,646	3,614	3,616	218
2017							5,291	4,986	4,837	4,727	187
2018								4,426	4,524	4,397	678
2019									4,146	4,299	952
2020										5,858	3,129
									Incurred losses and ALAE	$36,343	

Cumulative Paid Losses and ALAE through December 31,

Accident Year	2011*	2012*	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020
2011	$ 609	$ 2,259	$ 2,917	$ 3,188	$ 3,304	$ 3,387	$ 3,429	$ 3,474	$ 3,493	$ 3,507
2012		262	1,232	1,813	1,950	2,040	2,117	2,135	2,181	2,199
2013			526	1,459	1,906	2,105	2,226	2,307	2,347	2,376
2014				467	1,249	1,574	1,713	1,779	1,829	1,858
2015					581	1,614	1,969	2,166	2,271	2,453
2016						709	1,811	2,208	2,670	2,923
2017							1,028	2,734	3,660	3,972
2018								915	2,341	2,868
2019									751	2,282
2020										960
									Paid losses and ALAE	25,398
									Net unpaid losses and ALAE for 2011 – 2020 accident years	10,945
									Net unpaid losses and ALAE for accident years before 2011	335
									Net unpaid losses and ALAE	$11,280

* *Unaudited required supplemental information*

(15) Unpaid losses and loss adjustment expenses *(Continued)*

BHRG Casualty

Incurred Losses and ALAE through December 31,

Accident Year	2011*	2012*	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020	IBNR and Case Development Liabilities
2011	$ 2,635	$ 2,726	$ 2,595	$ 2,536	$ 2,447	$ 2,354	$ 2,346	$ 2,307	$ 2,272	$ 2,255	$ 279
2012		2,820	3,002	2,837	2,899	2,827	2,712	2,645	2,588	2,581	317
2013			2,160	2,298	2,328	2,170	2,114	2,060	1,964	1,892	387
2014				1,900	2,099	2,068	2,030	1,944	1,980	1,970	537
2015					1,902	2,109	2,137	2,035	1,908	1,870	455
2016						1,928	2,138	2,047	2,003	1,922	555
2017							2,216	2,711	2,588	2,494	762
2018								2,948	3,585	3,509	1,183
2019									3,455	3,931	1,924
2020										3,883	2,754
									Incurred losses and ALAE	$26,307	

Cumulative Paid Losses and ALAE through December 31,

Accident Year	2011*	2012*	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020
2011	$ 294	$ 824	$ 1,169	$ 1,412	$ 1,501	$ 1,595	$ 1,673	$ 1,713	$ 1,748	$ 1,776
2012		312	757	1,150	1,381	1,539	1,664	1,764	1,825	1,883
2013			294	530	818	947	1,052	1,155	1,215	1,273
2014				153	488	655	765	889	974	1,119
2015					199	500	725	846	938	1,029
2016						255	563	742	874	972
2017							233	574	830	1,282
2018								267	875	1,649
2019									356	906
2020										406
									Paid losses and ALAE	12,295
									Net unpaid losses and ALAE for 2011 – 2020 accident years	14,012
									Net unpaid losses and ALAE for accident years before 2011	8,878
									Net unpaid losses and ALAE	$22,890

* *Unaudited required supplemental information*

(15) Unpaid losses and loss adjustment expenses *(Continued)*

Required supplemental unaudited average historical claims duration information based on the net losses and ALAE incurred and paid accident year data in the preceding tables follows. The percentages show the average portions of net losses and ALAE paid by each succeeding year, with year 1 representing the current accident year.

Average Annual Percentage Payout of Incurred Losses by Age, Net of Reinsurance

In Year	1	2	3	4	5	6	7	8	9	10
GEICO Physical Damage	97%	2%								
GEICO Auto Liability	42%	29%	13%	7%	4%					
BH Primary Medical Professional Liability	2%	7%	12%	14%	14%	12%	9%	6%	5%	2%
BH Primary Workers' Compensation and Other Casualty	16%	21%	16%	13%	8%	4%	3%	2%	1%	1%
BHRG Property	19%	37%	17%	8%	4%	4%	1%	2%	1%	0%
BHRG Casualty	11%	16%	14%	9%	5%	5%	5%	2%	2%	1%

(16) Retroactive reinsurance contracts

Retroactive reinsurance policies provide indemnification of losses and loss adjustment expenses of short-duration insurance contracts with respect to underlying loss events that occurred prior to the contract inception date. Claims payments may commence immediately after the contract date or, when applicable, once a contractual retention amount has been reached. Reconciliations of the changes in estimated liabilities for retroactive reinsurance unpaid losses and loss adjustment expenses ("claim liabilities") and related deferred charge reinsurance assumed assets for each of the three years ended December 31, 2020 follow (in millions).

	2020		2019		2018	
	Unpaid losses and loss adjustment expenses	Deferred charges reinsurance assumed	Unpaid losses and loss adjustment expenses	Deferred charges reinsurance assumed	Unpaid losses and loss adjustment expenses	Deferred charges reinsurance assumed
Balances at beginning of year	$ 42,441	$(13,747)	$ 41,834	$(14,104)	$ 42,937	$(15,278)
Incurred losses and loss adjustment expenses:						
Current year contracts	—	—	1,138	(453)	603	(86)
Prior years' contracts	(399)	1,306	378	810	(341)	1,260
Total	(399)	1,306	1,516	357	262	1,174
Paid losses and loss adjustment expenses	(1,076)	—	(909)	—	(1,365)	—
Balances at December 31	$ 40,966	$(12,441)	$ 42,441	$(13,747)	$ 41,834	$(14,104)
Incurred losses and loss adjustment expenses, net of deferred charges	$ 907		$ 1,873		$ 1,436	

In the preceding table, classifications of incurred losses and loss adjustment expenses are based on the inception dates of the contracts. We do not believe that analysis of losses incurred and paid by accident year of the underlying event is relevant or meaningful given that our exposure to losses incepts when the contract incepts. Further, we believe the classifications of reported claims and case development liabilities have little or no practical analytical value.

Estimated ultimate claim liabilities included $17.7 billion at December 31, 2020 and $18.2 billion at December 31, 2019, with respect to an agreement with various subsidiaries of American International Group, Inc. (collectively, "AIG") to indemnify AIG for 80% of up to $25 billion of losses and allocated loss adjustment expenses in excess of $25 billion retained by AIG for certain commercial insurance loss events occurring prior to 2016. The related deferred charge assets were $5.4 billion at December 31, 2020 and $6.3 billion at December 31, 2019.

(16) Retroactive reinsurance contracts *(Continued)*

Incurred losses and loss adjustment expenses related to contracts written in prior years were $907 million in 2020, $1,188 million in 2019 and $919 million in 2018, which included recurring amortization of deferred charges and the effect of changes in the timing and amount of expected future loss payments.

In establishing retroactive reinsurance claim liabilities, we analyze historical aggregate loss payment patterns and project losses into the future under various probability-weighted scenarios. We expect the claim-tail to be very long for many contracts, with some lasting several decades. We monitor claim payment activity and review ceding company reports and other information concerning the underlying losses. We reassess and revise the expected timing and amounts of ultimate losses periodically or when significant events are revealed through our monitoring and review processes.

Our retroactive reinsurance claim liabilities include estimated liabilities for environmental, asbestos and other latent injury exposures of approximately $12.5 billion at December 31, 2020 and $12.9 billion at December 31, 2019. Retroactive reinsurance contracts are generally subject to aggregate policy limits and thus, our exposure to such claims under these contracts is likewise limited. We monitor evolving case law and its effect on environmental and other latent injury claims. Changing laws or government regulations, newly identified toxins, newly reported claims, new theories of liability, new contract interpretations and other factors could result in increases in these liabilities, which could be material to our results of operations. We are unable to reliably estimate the amount of additional net loss or the range of net loss that is reasonably possible.

(17) Notes payable and other borrowings

Notes payable and other borrowings are summarized below (in millions). The weighted average interest rates and maturity date ranges shown in the following tables are based on borrowings as of December 31, 2020.

	Weighted Average Interest Rate	December 31, 2020	December 31, 2019
Insurance and other:			
Berkshire Hathaway Inc. ("Berkshire"):			
U.S. Dollar denominated due 2021-2047	3.2%	$ 8,308	$ 8,324
Euro denominated due 2021-2035	1.0%	8,326	7,641
Japanese Yen denominated due 2023-2060	0.7%	6,031	3,938
Berkshire Hathaway Finance Corporation ("BHFC"):			
U.S. Dollar denominated due 2021-2050	3.7%	10,766	8,679
Great Britain Pound denominated due 2039-2059	2.5%	2,347	2,274
Other subsidiary borrowings due 2021-2045	4.2%	4,682	5,262
Short-term subsidiary borrowings	2.5%	1,062	1,472
		$ 41,522	$ 37,590

In March 2020, Berkshire repaid €1.0 billion of maturing senior notes and issued €1.0 billion of 0.0% senior notes due in 2025. In April 2020, Berkshire issued ¥195.5 billion (approximately $1.8 billion) of senior notes with maturity dates ranging from 2023 to 2060 and a weighted average interest rate of 1.07%.

Borrowings of BHFC, a wholly owned finance subsidiary of Berkshire, consist of senior unsecured notes used to fund manufactured housing loans originated or acquired and equipment held for lease of certain subsidiaries. BHFC borrowings are fully and unconditionally guaranteed by Berkshire. During 2020, BHFC repaid $900 million of maturing senior notes and issued $3.0 billion of senior notes consisting of $500 million of 1.85% notes due in 2030, $750 million of 1.45% notes due in 2030 and $1.75 billion of 2.85% notes due in 2050.

The carrying values of Berkshire and BHFC non-U.S. Dollar denominated senior notes (€6.85 billion, £1.75 billion and ¥625.5 billion par) reflect the applicable exchange rates as of the balance sheet dates. The effects of changes in foreign currency exchange rates during the period are recorded in earnings as a component of selling, general and administrative expenses. Changes in the exchange rates resulted in pre-tax losses of approximately $1.0 billion in 2020 and pre-tax gains of $192 million in 2019 and $366 million in 2018.

(17) Notes payable and other borrowings *(Continued)*

In addition to BHFC borrowings, Berkshire guaranteed approximately $1.2 billion of other subsidiary borrowings at December 31, 2020. Generally, Berkshire's guarantee of a subsidiary's debt obligation is an absolute, unconditional and irrevocable guarantee for the full and prompt payment when due of all payment obligations.

	Weighted Average Interest Rate	December 31, 2020	December 31, 2019
Railroad, utilities and energy:			
Berkshire Hathaway Energy Company ("BHE") and subsidiaries:			
BHE senior unsecured debt due 2021-2051	4.2%	$ 13,447	$ 8,581
Subsidiary and other debt due 2021-2064	4.1%	36,420	30,772
Short-term borrowings	1.8%	2,286	3,214
Burlington Northern Santa Fe ("BNSF") and subsidiaries due 2021-2097	4.6%	23,220	23,211
		$ 75,373	$ 65,778

BHE subsidiary debt represents amounts issued pursuant to separate financing agreements. Substantially all of the assets of certain BHE subsidiaries are, or may be, pledged or encumbered to support or otherwise secure debt. These borrowing arrangements generally contain various covenants, including covenants which pertain to leverage ratios, interest coverage ratios and/or debt service coverage ratios. In November 2020, BHE's subsidiary debt increased $5.6 billion for the debt assumed in connection with the Dominion pipeline business acquisition. See Note 2 to the Consolidated Financial Statements. During 2020, BHE and its subsidiaries also issued new term debt of approximately $7.6 billion with maturity dates ranging from 2025 to 2062 and a weighted average interest rate of 3.2% and repaid $3.2 billion of term debt and reduced short-term borrowings.

BNSF's borrowings are primarily senior unsecured debentures. During 2020, BNSF issued $575 million of 3.05% senior unsecured debentures due in 2051 and repaid debt of $570 million. As of December 31, 2020, BNSF, BHE and their subsidiaries were in compliance with all applicable debt covenants. Berkshire does not guarantee any debt, borrowings or lines of credit of BNSF, BHE or their subsidiaries.

As of December 31, 2020, our subsidiaries had unused lines of credit and commercial paper capacity aggregating approximately $9.3 billion to support short-term borrowing programs and provide additional liquidity. Such unused lines of credit included approximately $8.2 billion related to BHE and its subsidiaries.

Debt principal repayments expected during each of the next five years are as follows (in millions). Amounts in 2021 include short-term borrowings.

	2021	2022	2023	2024	2025
Insurance and other	$ 4,354	$ 1,593	$ 6,021	$ 2,343	$ 2,817
Railroad, utilities and energy	5,044	3,405	4,792	3,965	3,777
	$ 9,398	$ 4,998	$ 10,813	$ 6,308	$ 6,594

(18) Income taxes

The liabilities for income taxes reflected in our Consolidated Balance Sheets are as follows (in millions).

	December 31, 2020	December 31, 2019
Currently payable (receivable)	$ (276)	$ 24
Deferred	73,261	65,823
Other	1,113	952
	$ 74,098	$ 66,799

(18) Income taxes *(Continued)*

The tax effects of temporary differences that give rise to significant portions of deferred tax assets and deferred tax liabilities are shown below (in millions).

	December 31, 2020	December 31, 2019
Deferred tax liabilities:		
Investments – unrealized appreciation and cost basis differences	$ 40,181	$ 32,134
Deferred charges reinsurance assumed	2,613	2,890
Property, plant and equipment and equipment held for lease	30,203	29,388
Goodwill and other intangible assets	6,753	7,293
Other	3,736	3,144
	83,486	74,849
Deferred tax assets:		
Unpaid losses and loss adjustment expenses	(1,135)	(1,086)
Unearned premiums	(900)	(853)
Accrued liabilities	(2,193)	(1,981)
Regulatory liabilities	(1,421)	(1,610)
Other	(4,576)	(3,496)
	(10,225)	(9,026)
Net deferred tax liability	$ 73,261	$ 65,823

We have not established deferred income taxes on accumulated undistributed earnings of certain foreign subsidiaries, which are expected to be reinvested indefinitely. Repatriation of all accumulated earnings of foreign subsidiaries would be impracticable to the extent that such earnings represent capital to support normal business operations. Generally, no U.S. federal income taxes will be imposed on future distributions of foreign earnings under current law. However, distributions to the U.S. or other foreign jurisdictions could be subject to withholding and other local taxes.

On December 22, 2017, legislation known as the Tax Cuts and Jobs Act of 2017 ("TCJA") was enacted. Among its provisions, the TCJA reduced the statutory U.S. Corporate income tax rate from 35% to 21% effective January 1, 2018 and provided for a one-time tax on certain accumulated undistributed post-1986 earnings of foreign subsidiaries. These effects were largely recorded in 2017 upon the enactment. In 2018, we reduced our estimate of the income taxes on the deemed repatriation of earnings of foreign subsidiaries and recognized additional deferred income tax rate change effects.

Income tax expense reflected in our Consolidated Statements of Earnings for each of the three years ending December 31, 2020 is as follows (in millions).

	2020	2019	2018
Federal	$ 10,596	$ 19,069	$ (1,613)
State	1,086	625	175
Foreign	758	1,210	1,117
	$ 12,440	$ 20,904	$ (321)
Current	$ 5,052	$ 5,818	$ 5,176
Deferred	7,388	15,086	(5,497)
	$ 12,440	$ 20,904	$ (321)

(18) Income taxes *(Continued)*

Income tax expense is reconciled to hypothetical amounts computed at the U.S. federal statutory rate for each of the three years ending December 31, 2020 in the table below (in millions).

	2020	2019	2018
Earnings before income taxes	$ 55,693	$ 102,696	$ 4,001
Hypothetical income tax expense computed at the U.S. federal statutory rate	$ 11,696	$ 21,566	$ 840
Dividends received deduction and tax-exempt interest	(448)	(433)	(393)
State income taxes, less U.S. federal income tax benefit	858	494	138
Foreign tax rate differences	13	(6)	271
U.S. income tax credits	(1,519)	(942)	(711)
Net benefit from the enactment of the TCJA	—	—	(302)
Goodwill impairments	1,977	20	21
Other differences, net	(137)	205	(185)
	$ 12,440	$ 20,904	$ (321)
Effective income tax rate	22.3%	20.4%	(8.0)%

We file income tax returns in the United States and in state, local and foreign jurisdictions. We have settled income tax liabilities with the U.S. federal taxing authority (“IRS”) for tax years through 2011 and the tax years 2012 and 2013 remain open. The IRS is auditing Berkshire’s consolidated U.S. federal income tax returns for the 2014 through 2016 tax years. We are also under audit or subject to audit with respect to income taxes in many state and foreign jurisdictions. It is reasonably possible that certain of these income tax examinations will be settled in 2021. We currently do not believe that the outcome of unresolved issues or claims will be material to our Consolidated Financial Statements.

At December 31, 2020 and 2019, net unrecognized tax benefits were $1,113 million and $952 million, respectively. Included in the balance at December 31, 2020, were $920 million of tax positions that, if recognized, would impact the effective tax rate. The remaining balance in net unrecognized tax benefits principally relates to tax positions where the ultimate recognition is highly certain but there is uncertainty about the timing of recognition. Because of the impact of deferred income tax accounting, these positions, when recognized, would not affect the annual effective income tax rate. We recorded income tax expense of $60 million in 2020 and $377 million in 2019 for uncertain tax positions related to investments by a subsidiary in certain tax equity investment funds that generated income tax benefits from 2015 through 2018. We now believe that it is more likely than not those income tax benefits are not valid. We do not expect any material increases to the estimated amount of unrecognized tax benefits during 2021.

(19) Dividend restrictions – Insurance subsidiaries

Payments of dividends by our insurance subsidiaries are restricted by insurance statutes and regulations. Without prior regulatory approval, our principal insurance subsidiaries may declare up to approximately $23 billion as ordinary dividends during 2021. Investments in fixed maturity and equity securities and short-term investments on deposit with U.S. state insurance authorities in accordance with state insurance regulations were approximately $5.5 billion at December 31, 2020 and $6.3 billion at December 31, 2019.

Combined shareholders’ equity of U.S. based insurance subsidiaries determined pursuant to statutory accounting rules (Surplus as Regards Policyholders) was approximately $237 billion at December 31, 2020 and $216 billion at December 31, 2019. Statutory surplus differs from the corresponding amount based on GAAP, due to differences in accounting for certain assets and liabilities. For instance, deferred charges reinsurance assumed, deferred policy acquisition costs, unrealized gains on certain investments and related deferred income taxes are recognized for GAAP but not for statutory reporting purposes. In addition, the carrying values of certain assets, such as goodwill and non-insurance entities owned by our insurance subsidiaries, are not fully recognized for statutory reporting purposes.

(20) Fair value measurements

Our financial assets and liabilities are summarized below as of December 31, 2020 and December 31, 2019, with fair values shown according to the fair value hierarchy (in millions). The carrying values of cash and cash equivalents, U.S. Treasury Bills, receivables and accounts payable, accruals and other liabilities are considered to be reasonable estimates of their fair values.

	Carrying Value	Fair Value	Quoted Prices (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
December 31, 2020					
Investments in fixed maturity securities:					
U.S. Treasury, U.S. government corporations and agencies	$ 3,403	$ 3,403	$ 3,358	$ 45	$ —
Foreign governments	11,338	11,338	9,259	2,079	—
Corporate bonds	5,191	5,191	—	5,191	—
Other	478	478	—	478	—
Investments in equity securities	281,170	281,170	271,848	38	9,284
Investment in Kraft Heinz common stock	13,336	11,280	11,280	—	—
Loans and finance receivables	19,201	20,554	—	2,692	17,862
Derivative contract assets *(1)*	270	270	1	72	197
Derivative contract liabilities:					
Railroad, utilities and energy *(1)*	121	121	6	96	19
Equity index put options	1,065	1,065	—	—	1,065
Notes payable and other borrowings:					
Insurance and other	41,522	46,676	—	46,665	11
Railroad, utilities and energy	75,373	92,593	—	92,593	—
December 31, 2019					
Investments in fixed maturity securities:					
U.S. Treasury, U.S. government corporations and agencies	$ 3,090	$ 3,090	$ 3,046	$ 44	$ —
Foreign governments	8,638	8,638	5,437	3,201	—
Corporate bonds	6,352	6,352	—	6,350	2
Other	605	605	—	605	—
Investments in equity securities	248,027	248,027	237,271	46	10,710
Investment in Kraft Heinz common stock	13,757	10,456	10,456	—	—
Loans and finance receivables	17,527	17,861	—	1,809	16,052
Derivative contract assets *(1)*	145	145	—	23	122
Derivative contract liabilities:					
Railroad, utilities and energy *(1)*	76	76	6	59	11
Equity index put options	968	968	—	—	968
Notes payable and other borrowings:					
Insurance and other	37,590	40,589	—	40,569	20
Railroad, utilities and energy	65,778	76,237	—	76,237	—

(1) *Assets are included in other assets and liabilities are included in accounts payable, accruals and other liabilities.*

(20) Fair value measurements *(Continued)*

The fair values of substantially all of our financial instruments were measured using market or income approaches. The hierarchy for measuring fair value consists of Levels 1 through 3, which are described below.

Level 1 – Inputs represent unadjusted quoted prices for identical assets or liabilities exchanged in active markets.

Level 2 – Inputs include directly or indirectly observable inputs (other than Level 1 inputs) such as quoted prices for similar assets or liabilities exchanged in active or inactive markets; quoted prices for identical assets or liabilities exchanged in inactive markets; other inputs that may be considered in fair value determinations of the assets or liabilities, such as interest rates and yield curves, volatilities, prepayment speeds, loss severities, credit risks and default rates; and inputs that are derived principally from or corroborated by observable market data by correlation or other means. Pricing evaluations generally reflect discounted expected future cash flows, which incorporate yield curves for instruments with similar characteristics, such as credit ratings, estimated durations and yields for other instruments of the issuer or entities in the same industry sector.

Level 3 – Inputs include unobservable inputs used in the measurement of assets and liabilities. Management is required to use its own assumptions regarding unobservable inputs because there is little, if any, market activity in the assets or liabilities and it may be unable to corroborate the related observable inputs. Unobservable inputs require management to make certain projections and assumptions about the information that would be used by market participants in valuing assets or liabilities.

Reconciliations of assets and liabilities measured and carried at fair value on a recurring basis with the use of significant unobservable inputs (Level 3) for each of the three years ending December 31, 2020 follow (in millions).

	Investments in equity and fixed maturity securities	Net derivative contract liabilities
Balance December 31, 2017	$ 6	$ (2,069)
Gains (losses) included in:		
Earnings	—	(118)
Other comprehensive income	—	2
Regulatory assets and liabilities	—	3
Acquisitions	2	3
Dispositions and settlements	(1)	(164)
Balance December 31, 2018	7	(2,343)
Gains (losses) included in:		
Earnings	404	1,972
Other comprehensive income	—	(1)
Regulatory assets and liabilities	—	(26)
Acquisitions	10,000	6
Dispositions and settlements	(4)	(465)

Balance December 31, 2019	10,407	(857)
Gains (losses) included in:		
Earnings	(1,426)	603
Other comprehensive income	—	—
Regulatory assets and liabilities	—	(17)
Acquisitions	—	5
Dispositions and settlements	(2)	(621)
Balance December 31, 2020	$ 8,979	$ (887)

(20) Fair value measurements *(Continued)*

We acquired investments in Occidental Cumulative Perpetual Preferred Stock ("Occidental Preferred") and Occidental common stock warrants in August 2019 at an aggregate cost of $10 billion. We currently consider the related fair value measurements to contain Level 3 inputs. See Note 4 for information regarding these investments.

Quantitative information as of December 31, 2020, with respect to assets and liabilities measured and carried at fair value on a recurring basis with the use of significant unobservable inputs (Level 3) follows (in millions).

	Fair Value	Principal Valuation Techniques	Unobservable Inputs	Weighted Average
Investments in equity securities:				
Preferred stock	$ 8,891	Discounted cash flow	Expected duration	9 years
			Discount for transferability restrictions and subordination	375 bps
Common stock warrants	86	Warrant pricing model	Expected duration	9 years
			Volatility	32%
Derivative contract liabilities	1,065	Option pricing model	Volatility	19%

Investments in equity securities in the preceding table include our investments in the Occidental Preferred and Occidental common stock warrants. These investments are subject to contractual restrictions on transferability and contain provisions that currently prevent us from economically hedging our investments. In applying discounted cash flow techniques in valuing the Occidental Preferred, we made assumptions regarding the expected duration of the investment. The Occidental Preferred is redeemable at Occidental's option beginning in 2029. We also made estimates regarding the impact of subordination, as the Occidental Preferred has a lower priority in liquidation than debt instruments. In valuing the Occidental common stock warrants, we used a warrant valuation model. While most of the inputs to the model are observable, we made assumptions regarding the expected duration and volatility of the warrants. The Occidental common stock warrants contractually expire on the one-year anniversary on which no Occidental Preferred remains outstanding.

Our equity index put option contracts are illiquid and contain contract terms that are not standard in derivatives markets. For example, we are not required to post collateral under most of our contracts. We determine the fair value of the equity index put option contract liabilities based on the Black-Scholes option valuation model.

(21) Accumulated other comprehensive income

A summary of the net changes in after-tax accumulated other comprehensive income attributable to Berkshire Hathaway shareholders for each of the three years ending December 31, 2020 follows (in millions).

	Unrealized appreciation of investments, net	Foreign currency translation	Defined benefit pension plans	Other	Accumulated other comprehensive income
Balance December 31, 2017	$ 62,093	$ (3,114)	$ (420)	$ 12	$ 58,571
Reclassifications to retained earnings upon adoption of new accounting standards	(61,340)	(65)	36	(6)	(61,375)
Other comprehensive income, net	(383)	(1,424)	(432)	28	(2,211)
Balance December 31, 2018	370	(4,603)	(816)	34	(5,015)
Other comprehensive income, net	111	257	(553)	(43)	(228)
Balance December 31, 2019	481	(4,346)	(1,369)	(9)	(5,243)
Other comprehensive income, net	55	1,264	(276)	(43)	1,000
Balance December 31, 2020	$ 536	$ (3,082)	$ (1,645)	$ (52)	$ (4,243)

(22) Common stock

Changes in Berkshire's issued, treasury and outstanding common stock during the three years ending December 31, 2020 are shown in the table below. In addition to our common stock, 1,000,000 shares of preferred stock are authorized, but none are issued.

	Class A, $5 Par Value (1,650,000 shares authorized)			Class B, $0.0033 Par Value (3,225,000,000 shares authorized)		
	Issued	Treasury	Outstanding	Issued	Treasury	Outstanding
Balance December 31, 2017	762,755	(11,680)	751,075	1,342,066,749	(1,409,762)	1,340,656,987
Conversions of Class A common stock to Class B common stock and exercises of replacement stock options	(20,542)	—	(20,542)	31,492,234	—	31,492,234
Treasury stock acquired	—	(1,217)	(1,217)	—	(4,729,147)	(4,729,147)
Balance December 31, 2018	742,213	(12,897)	729,316	1,373,558,983	(6,138,909)	1,367,420,074
Conversions of Class A common stock to Class B common stock and exercises of replacement stock options	(22,906)	—	(22,906)	34,624,869	—	34,624,869
Treasury stock acquired	—	(4,440)	(4,440)	—	(17,563,410)	(17,563,410)
Balance December 31, 2019	719,307	(17,337)	701,970	1,408,183,852	(23,702,319)	1,384,481,533
Conversions of Class A common stock to Class B common stock and exercises of replacement stock options	(40,784)	—	(40,784)	61,176,000	—	61,176,000
Treasury stock acquired	—	(17,255)	(17,255)	—	(95,614,062)	(95,614,062)
Balance December 31, 2020	678,523	(34,592)	643,931	1,469,359,852	(119,316,381)	1,350,043,471

Each Class A common share is entitled to one vote per share. Class B common stock possesses dividend and distribution rights equal to one-fifteen-hundredth (1/1,500) of such rights of Class A common stock. Each Class B common share possesses voting rights equivalent to one-ten-thousandth (1/10,000) of the voting rights of a Class A share. Unless otherwise required under Delaware General Corporation Law, Class A and Class B common shares vote as a single class. Each share of Class A common stock is convertible, at the option of the holder, into 1,500 shares of Class B common stock. Class B common stock is not convertible into Class A common stock. On an equivalent Class A common stock basis, there were 1,543,960 shares outstanding as of December 31, 2020 and 1,624,958 shares outstanding as of December 31, 2019.

Since we have two classes of common stock, we provide earnings per share data on the Consolidated Statements of Earnings for average equivalent Class A shares outstanding and average equivalent Class B shares outstanding. Class B shares are economically equivalent to one-fifteen-hundredth (1/1,500) of a Class A share. Average equivalent Class A shares outstanding represents average Class A shares outstanding plus one-fifteen-hundredth (1/1,500) of the average Class B shares outstanding. Average equivalent Class B shares outstanding represents average Class B shares outstanding plus 1,500 times average Class A shares outstanding.

Berkshire's common stock repurchase program, as amended, permits Berkshire to repurchase shares any time that Warren Buffett, Berkshire's Chairman of the Board and Chief Executive Officer, and Charlie Munger, Vice Chairman of the Board, believe that the repurchase price is below Berkshire's intrinsic value, conservatively determined. The program continues to allow share repurchases in the open market or through privately negotiated transactions and does not specify a maximum number of shares to be repurchased. However, repurchases will not be made if they would reduce the total value of Berkshire's consolidated cash, cash equivalents and U.S. Treasury Bill holdings below $20 billion. The repurchase program does not obligate Berkshire to repurchase any specific dollar amount or number of Class A or Class B shares and there is no expiration date to the program.

(23) Revenues from contracts with customers

We recognize revenue when a good or service is transferred to a customer. A good or service is transferred when or as the customer obtains control of that good or service. Revenues are based on the consideration we expect to receive in connection with our promises to deliver goods and services to our customers.

(23) Revenues from contracts with customers *(Continued)*

The following tables summarize customer contract revenues disaggregated by reportable segment and the source of the revenue for each of the three years ended December 31, 2020 (in millions). Other revenues included in consolidated revenues were primarily insurance premiums earned, interest, dividend and other investment income and leasing revenues, which are not considered to be revenues from contracts with customers under GAAP.

2020	Manufacturing	McLane Company	Service and retailing	BNSF	Berkshire Hathaway Energy	Insurance, Corporate and other	Total
Manufactured products:							
Industrial and commercial products	$20,772	$ —	$ 192	$ —	$ —	$ —	$ 20,964
Building products	15,943	—	—	—	—	—	15,943
Consumer products	14,757	—	—	—	—	—	14,757
Grocery and convenience store distribution	—	30,795	—	—	—	—	30,795
Food and beverage distribution	—	15,368	—	—	—	—	15,368
Auto sales	—	—	8,258	—	—	—	8,258
Other retail and wholesale distribution	2,452	—	12,470	—	—	—	14,922
Service	1,456	584	3,332	20,693	4,595	—	30,660
Electricity and natural gas	—	—	—	—	15,066	—	15,066
Total	55,380	46,747	24,252	20,693	19,661	—	166,733
Other revenues	3,598	93	3,859	57	1,353	69,817	78,777
	$58,978	$46,840	$28,111	$20,750	$21,014	$69,817	$245,510

2019	Manufacturing	McLane Company	Service and retailing	BNSF	Berkshire Hathaway Energy	Insurance, Corporate and other	Total
Manufactured products:							
Industrial and commercial products	$25,311	$ —	$ 184	$ —	$ —	$ —	$ 25,495
Building products	15,620	—	—	—	—	—	15,620
Consumer products	14,120	—	—	—	—	—	14,120
Grocery and convenience store distribution	—	33,057	—	—	—	—	33,057
Food and beverage distribution	—	16,767	—	—	—	—	16,767
Auto sales	—	—	8,481	—	—	—	8,481
Other retail and wholesale distribution	2,299	—	12,213	—	—	—	14,512
Service	1,642	539	4,062	23,302	4,096	—	33,641
Electricity and natural gas	—	—	—	—	14,819	—	14,819
Total	58,992	50,363	24,940	23,302	18,915	—	176,512
Other revenues	3,632	95	4,459	55	1,181	68,682	78,104
	$62,624	$50,458	$29,399	$23,357	$20,096	$68,682	$254,616

2018	Manufacturing	McLane Company	Service and retailing	BNSF	Berkshire Hathaway Energy	Insurance, Corporate and other	Total
Manufactured products:							
Industrial and commercial products	$25,707	$ —	$ 204	$ —	$ —	$ —	$ 25,911
Building products	14,323	—	—	—	—	—	14,323
Consumer products	14,790	—	—	—	—	—	14,790
Grocery and convenience store distribution	—	33,518	—	—	—	—	33,518
Food and beverage distribution	—	16,309	—	—	—	—	16,309
Auto sales	—	—	8,181	—	—	—	8,181
Other retail and wholesale distribution	2,091	—	12,067	—	—	—	14,158
Service	1,519	84	4,100	23,652	3,949	—	33,304
Electricity and natural gas	—	—	—	—	14,951	—	14,951
Total	58,430	49,911	24,552	23,652	18,900	—	175,445
Other revenues	3,340	76	4,297	51	1,070	63,558	72,392
	$61,770	$49,987	$28,849	$23,703	$19,970	$63,558	$247,837

(23) Revenues from contracts with customers *(Continued)*

A summary of the transaction price allocated to the significant unsatisfied remaining performance obligations relating to contracts with expected durations in excess of one year as of December 31, 2020 and the timing of when the performance obligations are expected to be satisfied follows (in millions).

	Less than 12 months	Greater than 12 months	Total
Electricity and natural gas	$ 3,210	$ 22,088	$ 25,298
Other sales and service contracts	1,228	2,382	3,610

(24) Pension plans

Certain of our subsidiaries sponsor defined benefit pension plans. Benefits under the plans are generally based on years of service and compensation or fixed benefit rates. Plan sponsors may make contributions to the plans to meet regulatory requirements and may also make discretionary contributions. The components of our net periodic pension expense for each of the three years ending December 31, 2020 follow (in millions).

	2020	2019	2018
Service cost	$ 235	$ 224	$ 271
Interest cost	510	618	593
Expected return on plan assets	(955)	(936)	(988)
Amortization of actuarial losses and other	171	26	188
Net periodic pension expense	$ (39)	$ (68)	$ 64

The projected benefit obligation ("PBO") is the actuarial present value of benefits earned based upon service and compensation prior to the valuation date and, if applicable, includes assumptions regarding future compensation levels. Benefit obligations under qualified U.S. defined benefit pension plans are funded through assets held in trusts. Pension obligations under certain non-U.S. plans and non-qualified U.S. plans are unfunded and the aggregate PBOs of such plans were approximately $1.6 billion and $1.3 billion as of December 31, 2020 and 2019, respectively. The cost of pension plans covering employees of certain regulated subsidiaries of BHE are generally recoverable through the regulated rate making process.

The funded status at year end 2020 and 2019 and reconciliations of the changes in PBOs and plan assets related to BHE's pension plans and all other pension plans for each of the two years ending December 31, 2020 follow (in millions).

	2020			2019		
	BHE	Other	Total	BHE	Other	Total
Benefit obligations						
PBO beginning of year	$ 4,898	$ 13,808	$ 18,706	$ 4,551	$ 12,371	$ 16,922
Service cost	33	202	235	32	192	224
Interest cost	133	377	510	161	457	618
Benefits paid	(285)	(709)	(994)	(257)	(776)	(1,033)
Settlements	(63)	(12)	(75)	(121)	(46)	(167)
Actuarial (gains) or losses and other	566	1,481	2,047	532	1,610	2,142
PBO end of year	$ 5,282	$ 15,147	$ 20,429	$ 4,898	$ 13,808	$ 18,706
Plan assets						
Plan assets beginning of year	$ 4,808	$ 11,688	$ 16,496	$ 4,385	$ 10,574	$ 14,959
Employer contributions	69	127	196	68	131	199
Benefits paid	(285)	(709)	(994)	(257)	(776)	(1,033)
Actual return on plan assets	554	1,820	2,374	650	1,764	2,414
Settlements	(63)	(12)	(75)	(121)	(46)	(167)
Other	75	(134)	(59)	83	41	124
Plan assets end of year	$ 5,158	$ 12,780	$ 17,938	$ 4,808	$ 11,688	$ 16,496
Funded status – net liability	$ 124	$ 2,367	$ 2,491	$ 90	$ 2,120	$ 2,210

(24) Pension plans *(Continued)*

The funded status reflected in assets was $1,351 million and in liabilities was $3,842 million at December 31, 2020. The funded status included in assets was $857 million and in liabilities was $3,067 million at December 31, 2019.

The accumulated benefit obligation ("ABO") is the actuarial present value of benefits earned based on service and compensation prior to the valuation date. The ABO was $19.4 billion at December 31, 2020 and $17.5 billion at December 31, 2019. Information for plans with PBOs and ABOs in excess of plan assets as of December 31, 2020 and 2019 follows (in millions)

	2020	2019
PBOs	$ 12,775	$ 12,625
Plan assets	9,018	9,627
ABOs	10,875	10,617
Plan assets	7,820	8,367

Weighted average assumptions used in determining PBOs and net periodic pension expense follow.

	2020	2019	2018
Discount rate applicable to pension benefit obligations	2.3%	3.1%	3.9%
Expected long-term rate of return on plan assets	6.2	6.4	6.4
Rate of compensation increase	2.6	2.5	2.6
Discount rate applicable to net periodic pension expense	3.1	4.0	3.4

Pension benefit payments expected over the next ten years are as follows (in millions): 2021 – $1,105; 2022 – $1,031; 2023 – $1,034; 2024 – $1,037; 2025 – $1,040; and 2026 to 2030 – $5,119. Sponsoring subsidiaries expect to contribute $202 million to the plans in 2021.

Fair value measurements of plan assets as of December 31, 2020 and 2019 follow (in millions).

	Fair Value				Investment funds and partnerships
	Total	Level 1	Level 2	Level 3	at net asset value
December 31, 2020					
Cash and cash equivalents	$ 383	$ 243	$ 140	$ —	$ —
Equity securities	11,383	10,123	851	409	—
Fixed maturity securities	3,173	2,214	926	33	—
Investment funds and other	2,999	198	398	56	2,347
	$ 17,938	$ 12,778	$ 2,315	$ 498	$ 2,347
December 31, 2019					
Cash and cash equivalents	$ 412	$ 309	$ 103	$ —	$ —
Equity securities	11,105	9,860	836	409	—
Fixed maturity securities	2,328	1,593	704	31	—
Investment funds and other	2,651	143	358	40	2,110
	$ 16,496	$ 11,905	$ 2,001	$ 480	$ 2,110

See Note 20 for a discussion of the three levels of fair value measurements. Plan assets are generally invested with the long-term objective of producing earnings to adequately cover expected benefit obligations, while assuming a prudent level of risk. Allocations may change due to changing market conditions and investment opportunities. The expected rates of return on plan assets reflect subjective assessments of expected long-term investment returns. Generally, past investment returns are not given significant consideration when establishing assumptions for expected long-term rates of return on plan assets. Actual experience will differ from the assumed rates of return.

(24) Pension plans *(Continued)*

A reconciliation of the pre-tax accumulated other comprehensive income (loss) related to defined benefit pension plans for each of the two years ending December 31, 2020 follows (in millions).

	2020	2019
Balance beginning of year	$ (1,896)	$ (1,184)
Amount included in net periodic pension expense	141	94
Actuarial gains (losses) and other	(496)	(806)
Balance end of year	$ (2,251)	$ (1,896)

Several of our subsidiaries also sponsor defined contribution retirement plans, such as 401(k) or profit-sharing plans. Employee contributions are subject to regulatory limitations and the specific plan provisions. Several plans provide for employer matching contributions up to levels specified in the plans and provide for additional discretionary contributions as determined by management. Our defined contribution plan expense was approximately $1.4 billion in 2020, $1.2 billion in 2019 and $1.0 billion in 2018.

(25) Contingencies and Commitments

We are parties in a variety of legal actions that routinely arise out of the normal course of business, including legal actions seeking to establish liability directly through insurance contracts or indirectly through reinsurance contracts issued by Berkshire subsidiaries. Plaintiffs occasionally seek punitive or exemplary damages. We do not believe that such normal and routine litigation will have a material effect on our financial condition or results of operations. Berkshire and certain of its subsidiaries are also involved in other kinds of legal actions, some of which assert or may assert claims or seek to impose fines and penalties. We believe that any liability that may arise as a result of other pending legal actions will not have a material effect on our consolidated financial condition or results of operations.

Our subsidiaries regularly make commitments in the ordinary course of business to purchase goods and services used in their businesses. As of December 31, 2020, estimated future payments under such arrangements were as follows: $14.6 billion in 2021, $4.5 billion in 2022, $3.4 billion in 2023, $2.8 billion in 2024, $3.1 billion in 2025 and $20.0 billion after 2025. The most significant of these relate to our railroad, utilities and energy businesses and our shared aircraft ownership and leasing business.

Pursuant to the terms of agreements with noncontrolling shareholders in our less than wholly-owned subsidiaries, we may be obligated to acquire their equity interests. If we had acquired all outstanding noncontrolling interests as of December 31, 2020, we estimate the cost would have been approximately $6.3 billion. However, the timing and the amount of any such future payments that might be required are contingent on future actions of the noncontrolling owners.

(26) Supplemental cash flow information

A summary of supplemental cash flow information for each of the three years ending December 31, 2020 is presented in the following table (in millions).

	2020	2019	2018
Cash paid during the period for:			
Income taxes	$ 5,001	$ 5,415	$ 4,354
Interest:			
Insurance and other	1,001	1,011	1,111
Railroad, utilities and energy	3,006	2,879	2,867
Non-cash investing and financing activities:			
Liabilities assumed in connection with business acquisitions	6,981	766	3,735
Operating lease liabilities arising from obtaining right-of-use assets	729	782	—

(27) Business segment data

Our operating businesses include a large and diverse group of insurance, manufacturing, service and retailing businesses. We organize our reportable business segments in a manner that reflects how management views those business activities. Certain businesses are grouped together for segment reporting based upon similar products or product lines, marketing, selling and distribution characteristics, even though those business units are operated under separate local management.

The tabular information that follows shows data of reportable segments reconciled to amounts reflected in our Consolidated Financial Statements. Intersegment transactions are not eliminated from segment results when management considers those transactions in assessing the results of the respective segments. Furthermore, our management does not consider investment and derivative gains/losses, impairments or amortization of certain business acquisition accounting adjustments related to Berkshire's business acquisitions or certain other corporate income and expense items in assessing the financial performance of operating units. Collectively, these items are included in reconciliations of segment amounts to consolidated amounts.

Berkshire's operating segments are as follows.

Business Identity	**Business Activity**
Insurance:	
GEICO	Underwriting private passenger automobile insurance mainly by direct response methods
Berkshire Hathaway Primary Group	Underwriting multiple lines of property and casualty insurance policies for primarily commercial accounts
Berkshire Hathaway Reinsurance Group	Underwriting excess-of-loss, quota-share and facultative reinsurance worldwide
BNSF	Operation of one of the largest railroad systems in North America
Berkshire Hathaway Energy	Regulated electric and gas utility, including power generation and distribution activities and real estate brokerage activities
Manufacturing	Manufacturers of numerous products including industrial, consumer and building products, including home building and related financial services
McLane Company	Wholesale distribution of groceries and non-food items
Service and retailing	Providers of numerous services including shared aircraft ownership programs, aviation pilot training, electronic components distribution, various retailing businesses, including automobile dealerships and trailer and furniture leasing

Notes to Consolidated Financial Statements *(Continued)*

(27) Business segment data *(Continued)*

A disaggregation of our consolidated data for each of the three most recent years is presented as follows (in millions).

	Revenues			Earnings before income taxes		
	2020	2019	2018	2020	2019	2018
Operating Businesses						
Insurance:						
Underwriting:						
GEICO	$ 35,093	$ 35,572	$ 33,363	$ 3,428	$ 1,506	$ 2,449
Berkshire Hathaway Primary Group	9,615	9,165	8,111	110	383	670
Berkshire Hathaway Reinsurance Group	18,693	16,341	15,944	(2,700)	(1,472)	(1,109)
Insurance underwriting	63,401	61,078	57,418	838	417	2,010
Investment income	5,960	6,615	5,518	5,949	6,600	5,503
Total insurance	69,361	67,693	62,936	6,787	7,017	7,513
BNSF	20,869	23,515	23,855	6,792	7,250	6,863
Berkshire Hathaway Energy	21,031	20,114	19,987	2,479	2,618	2,472
Manufacturing	59,079	62,730	61,883	8,010	9,522	9,366
McLane Company	46,840	50,458	49,987	251	288	246
Service and retailing	28,178	29,487	28,939	2,628	2,555	2,696
	245,358	253,997	247,587	26,947	29,250	29,156
Reconciliation to consolidated amount						
Investment and derivative gains/losses	—	—	—	40,746	72,607	(22,455)
Interest expense, not allocated to segments	—	—	—	(483)	(416)	(458)
Equity method investments	—	—	—	726	1,176	(2,167)
Goodwill and intangible asset impairments	—	—	—	(10,671)	(96)	(382)
Corporate, eliminations and other	152	619	250	(1,572)	175	307
	$ 245,510	$ 254,616	$ 247,837	$ 55,693	$ 102,696	$ 4,001

	Interest expense			Income tax expense		
	2020	2019	2018	2020	2019	2018
Operating Businesses						
Insurance	$ —	$ —	$ —	$ 1,089	$ 1,166	$ 1,374
BNSF	1,037	1,070	1,041	1,631	1,769	1,644
Berkshire Hathaway Energy	1,941	1,835	1,777	(1,010)	(526)	(452)
Manufacturing	737	752	690	1,795	2,253	2,188
McLane Company	—	—	15	71	71	59
Service and retailing	61	86	91	669	603	634
	3,776	3,743	3,614	4,245	5,336	5,447
Reconciliation to consolidated amount						
Investment and derivative gains/losses	—	—	—	8,855	15,159	(4,673)
Interest expense, not allocated to segments	483	416	458	(102)	(88)	(96)
Equity method investments	—	—	—	57	148	(753)
Corporate, eliminations and other	(176)	(198)	(219)	(615)	349	(246)
	$ 4,083	$ 3,961	$ 3,853	$ 12,440	$ 20,904	$ (321)

(27) Business segment data *(Continued)*

	Capital expenditures			Depreciation of tangible assets		
	2020	2019	2018	2020	2019	2018
Operating Businesses						
Insurance	$ 50	$ 108	$ 130	$ 74	$ 82	$ 79
BNSF	3,063	3,608	3,187	2,423	2,350	2,268
Berkshire Hathaway Energy	6,765	7,364	6,241	3,376	2,947	2,830
Manufacturing	2,133	2,981	3,116	2,026	1,951	1,890
McLane Company	98	158	276	204	225	204
Service and retailing	903	1,760	1,587	1,216	1,192	1,115
	$ 13,012	$ 15,979	$ 14,537	$ 9,319	$ 8,747	$ 8,386

	Goodwill at year-end			Identifiable assets at year-end		
	2020	2019	2018	2020	2019	2018
Operating Businesses						
Insurance	$ 15,224	$ 15,289	$ 15,289	$399,169	$364,550	$289,746
BNSF	14,851	14,851	14,851	73,809	73,699	70,242
Berkshire Hathaway Energy	11,763	9,979	9,851	109,286	88,651	80,543
Manufacturing	25,512	34,800	34,019	104,318	104,437	99,912
McLane Company	232	734	734	6,771	6,872	6,243
Service and retailing	6,152	6,229	6,281	26,173	26,494	24,724
	$ 73,734	$ 81,882	$ 81,025	719,526	664,703	571,410
Reconciliation to consolidated amount						
Corporate and other				80,469	71,144	55,359
Goodwill				73,734	81,882	81,025
				$873,729	$817,729	$707,794

Property/casualty and life/health insurance premiums written and earned are summarized below (in millions).

	Property/Casualty			Life/Health		
	2020	2019	2018	2020	2019	2018
Premiums Written:						
Direct	$ 47,838	$ 47,578	$ 44,513	$ 510	$ 839	$ 1,111
Assumed	11,533	10,214	8,970	5,960	5,046	5,540
Ceded	(898)	(821)	(869)	(42)	(45)	(49)
	$ 58,473	$ 56,971	$ 52,614	$ 6,428	$ 5,840	$ 6,602
Premiums Earned:						
Direct	$ 46,418	$ 46,540	$ 43,095	$ 510	$ 839	$ 1,111
Assumed	11,449	9,643	8,649	5,973	4,952	5,438
Ceded	(907)	(851)	(825)	(42)	(45)	(50)
	$ 56,960	$ 55,332	$ 50,919	$ 6,441	$ 5,746	$ 6,499

(27) Business segment data *(Continued)*

Insurance premiums written by geographic region (based upon the domicile of the insured or reinsured) are summarized below (in millions).

	Property/Casualty			Life/Health		
	2020	2019	2018	2020	2019	2018
United States	$ 50,250	$ 50,529	$ 46,146	$ 2,820	$ 2,553	$ 3,598
Western Europe	3,751	2,535	2,157	1,120	908	939
Asia Pacific	3,410	3,114	3,726	1,652	1,582	1,361
All other	1,062	793	585	836	797	704
	$ 58,473	$ 56,971	$ 52,614	$ 6,428	$ 5,840	$ 6,602

Consolidated sales, service and leasing revenues were $132.3 billion in 2020, $140.8 billion in 2019 and $139.1 billion in 2018. Sales, service and leasing revenues attributable to the United States were 86% in 2020, 85% in 2019 and 84% in 2018 of such amounts. The remainder of sales, service and leasing revenues were primarily in Europe, Canada and the Asia Pacific. Railroad, utilities and energy revenues were $41.8 billion in 2020, $43.5 billion in 2019 and $43.7 billion in 2018. In each of the three years, approximately 96% of such revenues were attributable to the United States. At December 31, 2020, approximately 89% of our consolidated net property, plant and equipment and equipment held for lease was located in the United States with the remainder primarily in Canada and the United Kingdom.

(28) Quarterly data

A summary of revenues and net earnings by quarter for each of the last two years follows. This information is unaudited. Amounts are in millions, except per share amounts.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2020				
Revenues	$ 61,265	$ 56,840	$ 63,024	$ 64,381
Net earnings (loss) attributable to Berkshire shareholders *	(49,746)	26,295	30,137	35,835
Net earnings (loss) attributable to Berkshire shareholders per equivalent Class A common share	(30,653)	16,314	18,994	23,015
2019				
Revenues	$ 60,678	$ 63,598	$ 64,972	$ 65,368
Net earnings attributable to Berkshire shareholders *	21,661	14,073	16,524	29,159
Net earnings attributable to Berkshire shareholders per equivalent Class A common share	13,209	8,608	10,119	17,909

* *Includes after-tax investment and derivative gains/losses as follows:*

	1st Quarter	*2nd Quarter*	*3rd Quarter*	*4th Quarter*
2020	*$ (55,617)*	*$ 31,645*	*$ 24,737*	*$ 30,826*
2019	*16,106*	*7,934*	*8,666*	*24,739*

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None

Item 9A. Controls and Procedures

At the end of the period covered by this Annual Report on Form 10-K, the Corporation carried out an evaluation, under the supervision and with the participation of the Corporation's management, including the Chairman (Chief Executive Officer) and the Senior Vice President (Chief Financial Officer), of the effectiveness of the design and operation of the Corporation's disclosure controls and procedures pursuant to Exchange Act Rule 13a-15. Based upon that evaluation, the Chairman (Chief Executive Officer) and the Senior Vice President (Chief Financial Officer) concluded that the Corporation's disclosure controls and procedures are effective in timely alerting them to material information relating to the Corporation (including its consolidated subsidiaries) required to be included in the Corporation's periodic SEC filings. The report called for by Item 308(a) of Regulation S-K is incorporated herein by reference to Management's Report on Internal Control Over Financial Reporting, included on page K-66 of this report. The attestation report called for by Item 308(b) of Regulation S-K is incorporated herein by reference to Report of Independent Registered Public Accounting Firm, included on page K-67 of this report. There has been no change in the Corporation's internal control over financial reporting during the quarter ended December 31, 2020 that has materially affected, or is reasonably likely to materially affect, the Corporation's internal control over financial reporting.

Item 9B. Other Information

None

Part III

Except for the information set forth under the caption "Executive Officers of the Registrant" in Part I hereof, information required by this Part (Items 10, 11, 12, 13 and 14) is incorporated by reference from the Registrant's definitive proxy statement, filed pursuant to Regulation 14A, for the Annual Meeting of Shareholders of the Registrant to be held on May 1, 2021, which meeting will involve the election of directors.

Part IV

Item 15. Exhibits and Financial Statement Schedules

(a)1. *Financial Statements*

The following Consolidated Financial Statements, as well as the Report of Independent Registered Public Accounting Firm, are included in Part II Item 8 of this report:

2. *Financial Statement Schedule*

Other schedules are omitted because they are not required, information therein is not applicable, or is reflected in the Consolidated Financial Statements or notes thereto.

(b) *Exhibits*

See the "Exhibit Index" at page K-120.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of
Berkshire Hathaway Inc.
Omaha, Nebraska

Opinion on the Financial Statement Schedule

We have audited the consolidated financial statements of Berkshire Hathaway Inc. and subsidiaries (the "Company") as of December 31, 2020 and 2019, and for each of the three years in the period ended December 31, 2020, and the Company's internal control over financial reporting as of December 31, 2020, and have issued our report thereon dated February 27, 2021; such consolidated financial statements and report are included elsewhere in this Form 10-K. Our audits also included the financial statement schedule of the Company listed in the Index at Item 15. This financial statement schedule is the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statement schedule based on our audits. In our opinion, such financial statement schedule, when considered in relation to the financial statements taken as a whole, presents fairly, in all material respects, the information set forth therein.

/s/ Deloitte & Touche LLP
Omaha, Nebraska
February 27, 2021

BERKSHIRE HATHAWAY INC. (Parent Company)
Condensed Financial Information
(Dollars in millions)
Schedule I
Balance Sheets

	December 31,	
	2020	**2019**
Assets:		
Cash and cash equivalents	$ 12,329	$ 15,004
Short-term investments in U.S. Treasury Bills	29,773	25,514
Investments in and advances to/from consolidated subsidiaries	411,826	392,162
Investment in The Kraft Heinz Company	13,336	13,757
Other assets	108	131
	$ 467,372	$ 446,568
Liabilities and Shareholders' Equity:		
Accounts payable, accrued interest and other liabilities	$ 369	$ 320
Income taxes, principally deferred	1,174	1,554
Notes payable and other borrowings	22,665	19,903
	24,208	21,777
Berkshire Hathaway shareholders' equity	443,164	424,791
	$ 467,372	$ 446,568

Statements of Earnings and Comprehensive Income

	Year ended December 31,		
	2020	**2019**	**2018**
Income items:			
From consolidated subsidiaries:			
Dividends and distributions	$ 26,110	$ 15,603	$ 9,658
Undistributed earnings (losses)	17,402	65,237	(3,952)
	43,512	80,840	5,706
Investment gains (losses)	(24)	(125)	(4)
Equity in net earnings (losses) of The Kraft Heinz Company	95	493	(2,730)
Other income	328	780	649
	43,911	81,988	3,621
Cost and expense items:			
General and administrative	194	122	216
Interest expense	489	591	601
Foreign exchange (gains) losses on non-U.S. Dollar denominated debt	970	(193)	(366)
Income tax expense (benefit)	(263)	51	(851)
	1,390	571	(400)
Net earnings attributable to Berkshire Hathaway shareholders	42,521	81,417	4,021
Other comprehensive income attributable to Berkshire Hathaway shareholders	1,000	(228)	(2,211)
Comprehensive income attributable to Berkshire Hathaway shareholders	$ 43,521	$ 81,189	$ 1,810

See Note to Condensed Financial Information

BERKSHIRE HATHAWAY INC. (Parent Company)
Condensed Financial Information
(Dollars in millions)
Schedule I (continued)
Statements of Cash Flows

	Year ended December 31,		
	2020	2019	2018
Cash flows from operating activities:			
Net earnings attributable to Berkshire Hathaway shareholders	$ 42,521	$ 81,417	$ 4,021
Adjustments to reconcile net earnings to cash flows from operating activities:			
Investment gains/losses	24	125	4
Undistributed earnings of consolidated subsidiaries	(17,402)	(65,237)	3,952
Non-cash dividends from subsidiaries	(8,296)	—	—
Income taxes payable	(72)	(56)	(972)
Other	1,100	(693)	3,062
Net cash flows from operating activities	17,875	15,556	10,067
Cash flows from investing activities:			
Investments in and advances to/from consolidated subsidiaries, net	(1,947)	60	460
Purchases of U.S. Treasury Bills	(54,715)	(40,107)	(29,740)
Sales and maturities of U.S. Treasury Bills	59,035	36,943	21,442
Other	11	737	—
Net cash flows from investing activities	2,384	(2,367)	(7,838)
Cash flows from financing activities:			
Proceeds from borrowings	2,923	3,967	17
Repayments of borrowings	(1,151)	(758)	(1,563)
Acquisition of treasury stock	(24,706)	(4,850)	(1,346)
Other	—	19	61
Net cash flows from financing activities	(22,934)	(1,622)	(2,831)
Increase (decrease) in cash and cash equivalents	(2,675)	11,567	(602)
Cash and cash equivalents at beginning of year	15,004	3,437	4,039
Cash and cash equivalents at end of year	$ 12,329	$ 15,004	$ 3,437
Other cash flow information:			
Income taxes paid	$ 3,391	$ 3,531	$ 2,790
Interest paid	359	364	388

Note to Condensed Financial Information

Berkshire currently owns 26.6% of the outstanding shares of The Kraft Heinz Company ("Kraft Heinz") common stock, which is accounted for pursuant to the equity method. See Note 5 to the accompanying Consolidated Financial Statements for additional information regarding this investment.

In 2020, the Parent Company repaid €1.0 billion of maturing senior notes and issued €1.0 billion of 0.0% senior notes due in 2025 and ¥195.5 billion (approximately $1.8 billion) of senior notes with maturity dates ranging from 2023 to 2060 with a weighted average interest rate of 1.07%. As of December 31, 2020, the Parent Company's non-U.S. Dollar denominated borrowings included €6.85 billion and ¥625.5 billion par value senior notes. The gains and losses from the periodic remeasurement of these non-U.S. Dollar denominated notes due to changes in foreign currency exchange rates are included in earnings. See Note 17 to the accompanying Consolidated Financial Statements for additional information.

Parent Company debt maturities over the next five years are as follows: 2021—$2,172 million; 2022—$600 million; 2023—$4,633 million; 2024—$2,272 million and 2025—$1,801 million. The Parent Company guarantees certain debt of subsidiaries, which in the aggregate, approximated $14.4 billion at December 31, 2020 and included $13.1 billion of debt issued by Berkshire Hathaway Finance Corporation. Such guarantees are an absolute, unconditional and irrevocable guarantee for the full and prompt payment when due of all present and future payment obligations. The Parent Company has also provided guarantees in connection with equity index put option contracts and certain retroactive reinsurance contracts issued by subsidiaries. The amounts of subsidiary payments under these contracts, if any, is contingent upon the outcome of future events.

EXHIBIT INDEX

Exhibit No.	
2(i)	Agreement and Plan of Merger dated as of June 19, 1998 between Berkshire and General Re Corporation. Incorporated by reference to Annex I to Registration Statement No. 333-61129 filed on Form S-4.
2(ii)	Agreement and Plan of Merger dated as of November 2, 2009 by and among Berkshire, R Acquisition Company, LLC and BNSF. Incorporated by reference to Annex A to Registration Statement No. 333-163343 on Form S-4.
2(iii)	Agreement and Plan of Merger dated August 8, 2015, by and among Berkshire, NW Merger Sub Inc. and Precision Castparts Corporation ("PCC") Incorporated by reference to Exhibit 2.1 to PCC's Current Report on Form 8-K filed on August 10, 2015 (SEC File No. 001-10348)
3(i)	Restated Certificate of Incorporation Incorporated by reference to Exhibit 3(i) to Form 10-K filed on March 2, 2015.
3(ii)	By-Laws Incorporated by reference to Exhibit 3(ii) to Form 8-K filed on May 4, 2016.
4.1	Indenture, dated as of December 22, 2003, between Berkshire Hathaway Finance Corporation, Berkshire Hathaway Inc. and The Bank of New York Mellon Trust Company, N.A. (as successor to J.P. Morgan Trust Company, National Association), as trustee. Incorporated by reference to Exhibit 4.1 on Form S-4 of Berkshire Hathaway Finance Corporation and Berkshire Hathaway Inc. filed on February 4, 2004. SEC File No. 333-112486
4.2	Indenture, dated as of February 1, 2010, among Berkshire Hathaway Inc., Berkshire Hathaway Finance Corporation and The Bank of New York Mellon Trust Company, N.A., as trustee. Incorporated by reference to Exhibit 4.1 to Berkshire's Registration Statement on Form S-3 filed on February 1, 2010. SEC File No. 333-164611
4.3	Indenture, dated as of January 26, 2016, by and among Berkshire Hathaway Inc., Berkshire Hathaway Finance Corporation and The Bank of New York Mellon Trust Company, N.A., as trustee. Incorporated by reference to Exhibit 4.1 to Berkshire's Registration Statement on Form S-3 filed on January 26, 2016. SEC File No. 333-209122
4.4	Indenture, dated as of December 1, 1995, between BNSF and The First National Bank of Chicago, as trustee. Incorporated by reference to Exhibit 4 on Form S-3 of BNSF filed on February 8, 1999.
4.5	Indenture, dated as of October 4, 2002, by and between MidAmerican Energy Holdings Company and The Bank of New York, Trustee. Incorporated by reference to Exhibit 4.1 to the Berkshire Hathaway Energy Company Registration Statement No. 333-101699 dated December 6, 2002.
	Other instruments defining the rights of holders of long-term debt of Registrant and its subsidiaries are not being filed since the total amount of securities authorized by all other such instruments does not exceed 10% of the total assets of the Registrant and its subsidiaries on a consolidated basis as of December 31, 2020. The Registrant hereby agrees to furnish to the Commission upon request a copy of any such debt instrument to which it is a party.
10.1	Equity Commitment Letter of Berkshire Hathaway Inc. with Hawk Acquisition Holding Corporation dated February 13, 2013. Incorporated by reference to Exhibit 10.1 on Form 8-K of Berkshire Hathaway Inc. filed on February 14, 2013.
14	Code of Ethics Berkshire's Code of Business Conduct and Ethics is posted on its Internet website at *www.berkshirehathaway.com*
21	Subsidiaries of Registrant
23	Consent of Independent Registered Public Accounting Firm
31.1	Rule 13a—14(a)/15d-14(a) Certification
31.2	Rule 13a—14(a)/15d-14(a) Certification
32.1	Section 1350 Certification

32.2 Section 1350 Certification

Exhibit No.	
95	Mine Safety Disclosures
101	The following financial information from Berkshire Hathaway Inc.'s Annual Report on Form 10-K for the year ended December 31, 2020, formatted in iXBRL (Inline Extensible Business Reporting Language) includes: (i) the Cover Page (ii) the Consolidated Balance Sheets, (iii) the Consolidated Statements of Earnings, (iv) the Consolidated Statements of Comprehensive Income, (v) the Consolidated Statements of Changes in Shareholders' Equity, (vi) the Consolidated Statements of Cash Flows, and (vii) the Notes to Consolidated Financial Statements and Schedule I, tagged in summary and detail.
104	Cover Page Interactive Data File (formatted as iXBRL and contained in Exhibit 101)

/S/

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

BERKSHIRE HATHAWAY INC.

Date: February 27, 2021

/S/ MARC D. HAMBURG

Marc D. Hamburg
Senior Vice President and
Principal Financial Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

/s/ WARREN E. BUFFETT **Warren E. Buffett**	Chairman of the Board of Directors—Chief Executive Officer	February 27, 2021 Date
/s/ GREGORY E. ABEL **Gregory E. Abel**	Director—Vice Chairman—Non Insurance Operations	February 27, 2021 Date
/s/ HOWARD G. BUFFETT **Howard G. Buffett**	Director	February 27, 2021 Date
/s/ STEPHEN B. BURKE **Stephen B. Burke**	Director	February 27, 2021 Date
/s/ KENNETH I. CHENAULT **Kenneth I. Chenault**	Director	February 27, 2021 Date
/s/ SUSAN L. DECKER **Susan L. Decker**	Director	February 27, 2021 Date
/s/ DAVID S. GOTTESMAN **David S. Gottesman**	Director	February 27, 2021 Date
/s/ CHARLOTTE GUYMAN **Charlotte Guyman**	Director	February 27, 2021 Date
/s/ AJIT JAIN **Ajit Jain**	Director—Vice Chairman—Insurance Operations	February 27, 2021 Date
/s/ CHARLES T. MUNGER **Charles T. Munger**	Director—Vice Chairman	February 27, 2021 Date
/s/ THOMAS S. MURPHY **Thomas S. Murphy**	Director	February 27, 2021 Date
/s/ RONALD L. OLSON **Ronald L. Olson**	Director	February 27, 2021 Date
/s/ WALTER SCOTT, JR. **Walter Scott, Jr.**	Director	February 27, 2021 Date
/s/ MERYL B. WITMER **Meryl B. Witmer**	Director	February 27, 2021 Date
/s/ MARC D. HAMBURG **Marc D. Hamburg**	Senior Vice President—Principal Financial Officer	February 27, 2021 Date
/s/ DANIEL J. JAKSICH **Daniel J. Jaksich**	Vice President—Principal Accounting Officer	February 27, 2021 Date

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K

☑ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2019
OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from ______ to ______
Commission file number 001-14905

BERKSHIRE HATHAWAY INC.

(Exact name of Registrant as specified in its charter)

Delaware	47-0813844
State or other jurisdiction of incorporation or organization	(I.R.S. Employer Identification No.)
3555 Farnam Street, Omaha, Nebraska	68131
(Address of principal executive office)	(Zip Code)

Registrant's telephone number, including area code (402) 346-1400

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbols	Name of each exchange on which registered
Class A Common Stock	BRK.A	New York Stock Exchange
Class B Common Stock	BRK.B	New York Stock Exchange
0.750% Senior Notes due 2023	BRK23	New York Stock Exchange
1.125% Senior Notes due 2027	BRK27	New York Stock Exchange
1.625% Senior Notes due 2035	BRK35	New York Stock Exchange
0.500% Senior Notes due 2020	BRK20	New York Stock Exchange
1.300% Senior Notes due 2024	BRK24	New York Stock Exchange
2.150% Senior Notes due 2028	BRK28	New York Stock Exchange
0.250% Senior Notes due 2021	BRK21	New York Stock Exchange
0.625% Senior Notes due 2023	BRK23A	New York Stock Exchange
2.375% Senior Notes due 2039	BRK39	New York Stock Exchange
2.625% Senior Notes due 2059	BRK59	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: NONE

Indicate by check mark if the Registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☑ No ☐

Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☑

Indicate by check mark whether the Registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☑ No ☐

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act. Large accelerated filer ☑ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐

If an emerging growth company, indicate by check mark if the Registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☑

State the aggregate market value of the voting stock held by non-affiliates of the Registrant as of June 30, 2019: $417,300,000,000*

Indicate the number of shares outstanding of each of the Registrant's classes of common stock:

February 13, 2020—Class A common stock, $5 par value	700,396 shares
February 13, 2020—Class B common stock, $0.0033 par value	1,385,994,959 shares

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Proxy Statement for the Registrant's Annual Meeting to be held May 2, 2020 are incorporated in Part III.

* This aggregate value is computed at the last sale price of the common stock as reported on the New York Stock Exchange on June 30, 2019. It does not include the value of Class A common stock and Class B common stock held by Directors and Executive Officers of the Registrant and members of their immediate families, some of whom may not constitute “affiliates” for purpose of the Securities Exchange Act of 1934.

Table of Contents

Part I

Item 1. Business Description

Berkshire Hathaway Inc. (“Berkshire,” “Company” or “Registrant”) is a holding company owning subsidiaries engaged in a large number of diverse business activities. The most important of these are insurance businesses conducted on both a primary basis and a reinsurance basis, a freight rail transportation business and a group of utility and energy generation and distribution businesses. Berkshire also owns and operates numerous other businesses engaged in a variety of activities, as identified herein. Berkshire is domiciled in the state of Delaware, and its corporate headquarters is in Omaha, Nebraska.

Berkshire’s operating businesses are managed on an unusually decentralized basis. There are essentially no centralized or integrated business functions (such as sales, marketing, purchasing, legal or human resources) and there is minimal involvement by Berkshire’s corporate headquarters in the day-to-day business activities of the operating businesses. Berkshire’s corporate senior management team participates in and is ultimately responsible for significant capital allocation decisions, investment activities and the selection of the Chief Executive to head each of the operating businesses. It also is responsible for establishing and monitoring Berkshire’s corporate governance practices, including, but not limited to, communicating the appropriate “tone at the top” messages to its employees and associates, monitoring governance efforts, including those at the operating businesses, and participating in the resolution of governance-related issues as needed.

Berkshire and its consolidated subsidiaries employ approximately 391,500 people worldwide.

Insurance and Reinsurance Businesses

Berkshire’s insurance and reinsurance business activities are conducted through numerous domestic and foreign-based insurance entities. Berkshire’s insurance businesses provide insurance and reinsurance of property and casualty and life, accident and health risks worldwide.

In direct or primary insurance activities, the insurer assumes the risk of loss from persons or organizations that are directly subject to the risks. Such risks may relate to property, casualty (or liability), life, accident, health, financial or other perils that may arise from an insurable event. In reinsurance activities, the reinsurer assumes defined portions of risks that other direct insurers or reinsurers assumed in their own insuring activities.

Reinsurance contracts are normally classified as treaty or facultative contracts. Treaty reinsurance refers to reinsurance coverage for all or a portion of a specified group or class of risks ceded by the direct insurer, while facultative reinsurance involves coverage of specific individual underlying risks. Reinsurance contracts are further classified as quota-share or excess. Under quota-share (proportional or pro-rata) reinsurance, the reinsurer shares proportionally in the original premiums and losses of the direct insurer or reinsurer. Excess (or non-proportional) reinsurance provides for the indemnification of the direct insurer or reinsurer for all or a portion of the loss in excess of an agreed upon amount or “retention.” Both quota-share and excess reinsurance contracts may provide for aggregate limits of indemnification.

Insurance and reinsurance are generally subject to regulatory oversight throughout the world. Except for regulatory considerations, there are virtually no barriers to entry into the insurance and reinsurance industry. Competitors may be domestic or foreign, as well as licensed or unlicensed. The number of competitors within the industry is not known. Insurers and reinsurers compete on the basis of reliability, financial strength and stability, financial ratings, underwriting consistency, service, business ethics, price, performance, capacity, policy terms and coverage conditions.

Insurers based in the United States (“U.S.”) are subject to regulation by their states of domicile and by those states in which they are licensed to write policies on an admitted basis. The primary focus of regulation is to assure that insurers are financially solvent and that policyholder interests are otherwise protected. States establish minimum capital levels for insurance companies and establish guidelines for permissible business and investment activities. States have the authority to suspend or revoke a company’s authority to do business as conditions warrant. States regulate the payment of dividends by insurance companies to their shareholders and other transactions with affiliates. Dividends, capital distributions and other transactions of extraordinary amounts are subject to prior regulatory approval.

Insurers may market, sell and service insurance policies in the states where they are licensed. These insurers are referred to as admitted insurers. Admitted insurers are generally required to obtain regulatory approval of their policy forms and premium rates. Non-admitted insurance markets have developed to provide insurance that is otherwise unavailable through admitted insurers. Non-admitted insurance, often referred to as “excess and surplus” lines, is procured by either state-licensed surplus lines brokers who place risks with insurers not licensed in that state or by the insured party’s direct procurement from non-admitted insurers. Non-admitted insurance is subject to considerably less regulation with respect to policy rates and forms. Reinsurers are normally not required to obtain regulatory approval of premium rates or reinsurance contracts.

The insurance regulators of every state participate in the National Association of Insurance Commissioners (“NAIC”). The NAIC adopts forms, instructions and accounting procedures for use by U.S. insurers and reinsurers in preparing and filing annual statutory financial statements. However, an insurer’s state of domicile has ultimate authority over these matters. In addition to its activities relating to the annual statement, the NAIC develops or adopts statutory accounting principles, model laws, regulations and programs for use by its members. Such matters deal with regulatory oversight of solvency, risk management, compliance with financial regulation standards and risk-based capital reporting requirements.

U.S. states, through the NAIC, and international insurance regulators through the International Association of Insurance Supervisors (“IAIS”) have been developing standards and best practices focused on establishing a common set of principles (“Insurance Core Principles”) and framework (“ComFrame”) for the regulation of large multi-national insurance groups. The standards address a variety of topics regarding supervision, coordination of regulators, insurance capital standards, risk management and governance. While the IAIS standards do not have legal effect, the states and the NAIC are implementing, and are expected to continue to implement, various regulatory tools and mandates. For example, the U.S. state regulators now require insurance groups to file an annual report, called an Own Risk Solvency Assessment or ORSA, with the group’s lead regulator. U.S. state regulators formed supervisory colleges intended to promote communication and cooperation amongst the various domestic international insurance regulators. The Nebraska Department of Insurance acts as the lead group wide supervisor for our group of insurance companies and chairs the Berkshire supervisory college. The NAIC is also developing further tools, including a group capital calculation tool and various liquidity assessments, that could be imposed on insurance groups in the future.

Berkshire’s insurance companies maintain capital strength at exceptionally high levels, which differentiates them from their competitors. Collectively, the combined statutory surplus of Berkshire’s U.S. based insurers was approximately $216 billion at December 31, 2019. Berkshire’s major insurance subsidiaries are rated AA+ by Standard & Poor’s and A++ (superior) by A.M. Best with respect to their financial condition and claims paying ability.

The Terrorism Risk Insurance Act of 2002 established within the Department of the Treasury a Terrorism Insurance Program (“Program”) for commercial property and casualty insurers by providing federal reinsurance of insured terrorism losses. The Program currently extends to December 31, 2027 through other Acts, most recently the Terrorism Risk Insurance Program Reauthorization Act of 2019 (the “2019 TRIA Reauthorization”). Hereinafter these Acts are collectively referred to as TRIA. Under TRIA, the Department of the Treasury is charged with certifying “acts of terrorism.” Coverage under TRIA occurs if the industry insured loss for certified events occurring during the calendar year exceeds $200 million in 2020, or any calendar year thereafter.

To be eligible for federal reinsurance, insurers must make available insurance coverage for acts of terrorism, by providing policyholders with clear and conspicuous notice of the amount of premium that will be charged for this coverage and of the federal share of any insured losses resulting from any act of terrorism. Assumed reinsurance is specifically excluded from TRIA participation. TRIA currently also excludes certain forms of direct insurance (such as personal and commercial auto, burglary, theft, surety and certain professional liability lines). Reinsurers are not required to offer terrorism coverage and are not eligible for federal reinsurance of terrorism losses.

During 2020 and thereafter, in the event of a certified act of terrorism, the federal government will reimburse insurers (conditioned on their satisfaction of policyholder notification requirements) for 80% of their insured losses in excess of an insurance group’s deductible. Under the Program, the deductible is 20% of the aggregate direct subject earned premium for relevant commercial lines of business in the immediately preceding calendar year. The aggregate deductible in 2020 for Berkshire’s insurance group is expected to approximate $1.3 billion. There is also an aggregate program limit of $100 billion on the amount of the federal government coverage for each TRIA year.

The extent of insurance regulation varies significantly among the countries in which our non-U.S. operations conduct business. While each country imposes licensing, solvency, auditing, and financial reporting requirements, the type and extent of the requirements differ substantially. For example:

- in some countries, insurers are required to prepare and file monthly and/or quarterly financial reports, and in others, only annual reports;
- some regulators require intermediaries to be involved in the sale of insurance products, whereas other regulators permit direct sales contact between the insurer and the customer;
- the extent of restrictions imposed upon an insurer's use of local and offshore reinsurance vary;
- policy form filing and rate regulation vary by country;
- the frequency of contact and periodic on-site examinations by insurance authorities differ by country;
- the scope and prescriptive requirements of an insurer’s risk management and governance framework vary significantly by country; and
- regulatory requirements relating to insurer dividend policies vary by country.

Significant variations can also be found in the size, structure, and resources of the local regulatory departments that oversee insurance activities. Certain regulators prefer close relationships with all subject insurers and others operate a risk-based approach.

Berkshire's insurance group operates in some countries through subsidiaries and in some countries through branches of subsidiaries. Berkshire insurance subsidiaries are located in several countries, including Germany, the United Kingdom, Ireland, Australia and South Africa, and also maintain branches in other countries, including Canada, various members of the European Union, Australia, New Zealand, Singapore, Hong Kong, Macau and Dubai. Most of these foreign jurisdictions impose local capital requirements. Other legal requirements include discretionary licensing procedures, local retention of funds and records, and data privacy and protection program requirements. Berkshire's international insurance companies are also subject to multinational application of certain U.S. laws.

There are various regulatory bodies and initiatives that impact Berkshire in multiple international jurisdictions and the potential for significant effect on the Berkshire insurance group could be heightened as a result of recent industry and economic developments.

On June 23, 2016, the United Kingdom ("UK") voted in a national referendum to withdraw from the EU ("Brexit"), which resulted in the UK's withdrawal from the EU on January 31, 2020. In anticipation of the UK leaving the EU, Berkshire Hathaway European Insurance DAC in Ireland was established to permit property and casualty insurance and reinsurance businesses to continue to operate in the European Union following Brexit. Following the withdrawal of the UK from the EU as result of Brexit, Berkshire expects to continue to maintain a substantial presence in London.

Berkshire's insurance underwriting operations include the following groups: (1) GEICO, (2) Berkshire Hathaway Primary Group and (3) Berkshire Hathaway Reinsurance Group. Except for retroactive reinsurance and periodic payment annuity products that generate significant amounts of up-front premiums along with estimated claims expected to be paid over very long time periods (creating "float," see Investments section below), Berkshire expects to achieve a net underwriting profit over time and to reject inadequately priced risks. Underwriting profit is defined as earned premiums less associated incurred losses, loss adjustment expenses and underwriting and policy acquisition expenses. Underwriting profit does not include income earned from investments. Berkshire's insurance businesses employ approximately 50,000 people. Additional information related to each of Berkshire's underwriting groups follows.

GEICO—GEICO is headquartered in Chevy Chase, Maryland. GEICO's insurance subsidiaries consist of Government Employees Insurance Company, GEICO General Insurance Company, GEICO Indemnity Company, GEICO Casualty Company, GEICO Advantage Insurance Company, GEICO Choice Insurance Company, GEICO Secure Insurance Company, GEICO County Mutual Insurance Company and GEICO Marine Insurance Company. The GEICO companies primarily offer private passenger automobile insurance to individuals in all 50 states and the District of Columbia. GEICO also insures motorcycles, all-terrain vehicles, recreational vehicles, boats and small commercial fleets and acts as an agent for other insurers who offer homeowners, renters, life and identity management insurance to individuals who desire insurance coverages other than those offered by GEICO.

GEICO's marketing is primarily through direct response methods in which applications for insurance are submitted directly to the companies via the Internet or by telephone, and to a lesser extent, through captive agents. GEICO conducts business through regional service centers and claims adjustment and other facilities in 39 states.

The automobile insurance business is highly competitive in the areas of price and service. GEICO competes for private passenger automobile insurance customers in the preferred, standard and non-standard risk markets with other companies that sell directly to the customer as well as with companies that use agency sales forces, including State Farm, Allstate (including Esurance), Progressive and USAA. Significant advertising campaigns and competitive rates contributed to a cumulative increase in voluntary policies-in-force of approximately 35% over the past five years. According to most recently published A.M. Best data for 2018, the five largest automobile insurers had a combined market share in 2018 of approximately 57%, with GEICO's market share being second largest at approximately 13.4%. Since the publication of that data, GEICO's management estimates its current market share is approximately 13.6%. Seasonal variations in GEICO's insurance business are not significant. However, extraordinary weather conditions or other factors may have a significant effect upon the frequency or severity of automobile claims.

State insurance departments stringently regulate private passenger auto insurance. As a result, it is difficult for insurance companies to differentiate their products. Competition for private passenger automobile insurance, which is substantial, tends to focus on price and level of customer service provided. GEICO's cost-efficient direct response marketing methods and emphasis on customer satisfaction enable it to offer competitive rates and value to its customers. GEICO primarily uses its own claims staff to manage and settle claims. The name and reputation of GEICO are material assets and management protects it and other service marks through appropriate registrations.

Berkshire Hathaway Primary Group—The Berkshire Hathaway Primary Group ("BH Primary") is a collection of independently managed insurers that provide a wide variety of insurance coverages to policyholders located principally in the United States. These various operations are discussed below.

NICO and certain affiliates ("NICO Primary") underwrite commercial motor vehicle and general liability insurance on an admitted basis and on an excess and surplus basis. Insurance coverages are offered nationwide primarily through insurance agents and brokers.

The Berkshire Hathaway Homestate Companies ("BHHC") is a group of insurers offering workers' compensation, commercial auto and commercial property coverages to a diverse client base. BHHC has a national reach, with the ability to provide first-dollar and small to large deductible workers' compensation coverage to employers in all states, except those where coverage is available only through state-operated workers' compensation funds. NICO Primary and BHHC are each based in Omaha, Nebraska.

Berkshire Hathaway Specialty Insurance ("BH Specialty") provides commercial property, casualty, healthcare professional liability, executive and professional lines, surety, travel, medical stop loss and homeowners insurance. BH Specialty writes business on both an excess and surplus lines basis and an admitted basis in the U.S., and on a locally admitted basis outside the U.S. BH Specialty is based in Boston, Massachusetts, with regional offices currently in several cities in the U.S. and international offices located in Australia, New Zealand, Canada and several countries in Asia and Europe. BH Specialty currently intends to further expand its operations. BH Specialty writes business through wholesale and retail insurance brokers, as well as managing general agents.

MedPro Group ("MedPro") is a leading provider of healthcare liability ("HCL") insurance in the United States. MedPro provides customized HCL insurance, claims, patient safety and risk solutions to physicians, surgeons, dentists and other healthcare professionals, as well as hospitals, senior care and other healthcare facilities. Additionally, MedPro provides HCL insurance solutions in Europe, delivers liability insurance to other professionals, and offers specialized accident and health insurance solutions to colleges and other customers through its subsidiaries and other Berkshire affiliates. MedPro is based in Fort Wayne, Indiana.

U.S. Liability Insurance Company ("USLI") includes a group of five specialty insurers that underwrite commercial, professional and personal lines insurance on an admitted basis, as well as an excess and surplus basis. USLI markets policies in all 50 states and the District of Columbia and Canada through wholesale and retail insurance agents. USLI companies also underwrite and market a wide variety of specialty insurance products. USLI is based in Wayne, Pennsylvania.

The Berkshire Hathaway GUARD Insurance Companies ("GUARD") is a group of five insurance companies that provide workers' compensation, business owners', commercial auto, commercial package and homeowners' products to over 350,000 small and mid-sized businesses. GUARD also offers complementary professional liability and umbrella products nationwide. Policies are offered through independent agents and retail and wholesale brokers. GUARD is based in Wilkes-Barre, Pennsylvania. Central States Indemnity Company of Omaha, based in Omaha, Nebraska, primarily writes Medicare Supplement insurance.

On October 1, 2018, NICO acquired MLMIC Insurance Company ("MLMIC"). MLMIC has been the leading writer of medical professional liability insurance in New York State for over 40 years. MLMIC distributes its policies mostly on a direct basis to medical and dental professionals, health care providers and hospitals. In October 2019, Berkshire sold its 81% interest in Applied Underwriters, Inc. ("Applied").

Berkshire Hathaway Reinsurance Group—Berkshire's combined global reinsurance business, referred to as the Berkshire Hathaway Reinsurance Group ("BHRG"), offers a wide range of coverages on property, casualty, life and health risks to insurers and reinsurers worldwide. Reinsurance business is written through National Indemnity Company ("NICO"), domiciled in Nebraska, its subsidiaries and various other insurance subsidiaries wholly owned by Berkshire (collectively, the "NICO Group") and General Re Corporation, domiciled in Delaware, and its subsidiaries (collectively the "General Re Group"). BHRG's underwriting operations in the U.S. are based in Stamford, Connecticut. BHRG also conducts business activities globally in 23 countries.

The type and volume of business written is dependent on market conditions, including prevailing premium rates and coverage terms. The level of underwriting activities often fluctuates significantly from year to year depending on the perceived level of price adequacy in specific insurance and reinsurance markets as well as from the timing of particularly large reinsurance transactions.

Property/casualty

The NICO Group offers traditional property/casualty reinsurance on both an excess-of-loss and a quota-share basis, catastrophe excess-of-loss treaty and facultative reinsurance, and primary insurance on an excess-of-loss basis for large or unusual risks for clients worldwide. The NICO Group periodically participates in underwriting placements with major brokers in the London Market through Berkshire Hathaway International Insurance, Ltd., based in Great Britain. Business is written through intermediary brokers or directly with the insured or reinsured.

The type and volume of business written by the NICO Group may vary significantly from period to period resulting from changes in perceived premium rate adequacy and from unique or large transactions. A significant portion of NICO Group's annual reinsurance premium volume currently derives from a 20% quota-share agreement with Insurance Australia Group Limited ("IAG") that expires July 1, 2025. IAG is a multi-line insurer in Australia, New Zealand and other Asia Pacific countries. The General Re Group conducts a global property and casualty reinsurance business. Reinsurance contracts are written on both a quota-share and excess basis for multiple lines of business. Contracts are primarily in the form of treaties, and to a lesser degree, on a facultative basis.

General Re Group conducts business in North America primarily through General Reinsurance Corporation ("GRC"), which is licensed in the District of Columbia and all states, except Hawaii, where it is an accredited reinsurer. GRC conducts operations in North America from its headquarters in Stamford, Connecticut and through 13 branch offices in the U.S. and Canada.

In North America, the General Re Group includes General Star National Insurance Company, General Star Indemnity Company and Genesis Insurance Company, which offer a broad array of specialty and surplus lines and property, casualty and professional liability coverages. Such business is marketed through a select group of wholesale brokers, managing general underwriters and program administrators, and offer solutions for the unique needs of public entity, commercial and captive customers.

General Re Group's international reinsurance business is conducted on a direct basis through General Reinsurance AG ("GRAG"), based in Cologne Germany, and through several other subsidiaries and branches in 23 countries. International business is also written through brokers, including Faraday Underwriting Limited ("Faraday"), a wholly-owned subsidiary. Faraday owns the managing agent of Syndicate 435 at Lloyd's of London and provides capacity and participates in 100% of the results of Syndicate 435.

Life/health

The General Re Group also conducts a global life and health reinsurance business. In the U.S. and internationally, the General Re Group writes life, disability, supplemental health, critical illness and long-term care coverages. The life/health business is marketed on a direct basis. Approximately 27% of the aggregate life/health net premiums written by the General Re Group were in the United States, compared to 18% in Western Europe and 55% throughout the rest of the world.

Berkshire Hathaway Life Insurance Company of Nebraska ("BHLN"), a subsidiary of NICO, and its affiliates write reinsurance covering various forms of traditional life insurance exposures and, on a limited basis, health insurance exposures. BHLN and its affiliates have also periodically reinsured certain guaranteed minimum death, income, and similar benefit coverages on closed-blocks of variable annuity reinsurance contracts.

Retroactive reinsurance

NICO also periodically writes retroactive reinsurance contracts. Retroactive reinsurance contracts indemnify ceding companies against the adverse development of claims arising from loss events that have already occurred under property and casualty policies issued in prior years. Coverages under such contracts are provided on an excess basis (above a stated retention) or for losses payable immediately after the inception of the contract. Contracts are normally subject to aggregate limits of indemnification and are occasionally exceptionally large in amount. Significant amounts of asbestos, environmental and latent injury claims may arise under these contracts. For instance, in January 2017, NICO entered into a retroactive reinsurance agreement with various subsidiaries of American International Group, Inc. (collectively, "AIG"). Under the agreement, NICO agreed to indemnify AIG for 80% of up to $25 billion in excess of $25 billion retained by AIG, of losses and allocated loss adjustment expenses with respect to certain commercial insurance loss events occurring in years prior to 2016.

The concept of time-value-of-money is an important element in establishing retroactive reinsurance contract prices and terms, since loss payments may occur over decades. Normally, expected ultimate losses payable under these policies are expected to exceed premiums, thus producing underwriting losses. Nevertheless, this business is written, in part, because of the large amounts of policyholder funds generated for investment, the economic benefit of which will be reflected through investment results in future periods.

Periodic payment annuity

BHLN writes periodic payment annuity insurance policies and reinsures existing annuity-like obligations. Under these policies, BHLN receives upfront premiums and agrees in the future to make periodic payments that often extend for decades. These policies, generally relate to the settlement of underlying personal injury or workers' compensation cases of other insurers, known as structured settlements. Similar to retroactive reinsurance contracts, time-value-of-money concepts are an important factor in establishing such premiums and underwriting losses are expected from the periodic accretion of time-value discounted liabilities.

Investments of insurance businesses—Berkshire's insurance subsidiaries hold significant levels of invested assets. Investment portfolios are managed by Berkshire's Chief Executive Officer and other in-house investment managers. Investments include a very large portfolio of publicly traded equity securities, which are concentrated in relatively few issuers, as well as fixed maturity securities and cash and short-term investments. Generally, there are no targeted allocations by investment type or attempts to match investment asset and insurance liability durations. However, investment portfolios have historically included a much greater proportion of equity securities than is customary in the insurance industry.

Invested assets derive from shareholder capital as well as funds provided from policyholders through insurance and reinsurance business ("float"). Float is the approximate amount of net policyholder funds generated through underwriting activities that is available for investment. The major components of float are unpaid losses and loss adjustment expenses, life, annuity and health benefit liabilities, unearned premiums and other policyholder liabilities less premium and reinsurance receivables, deferred policy acquisition costs and deferred charges on reinsurance contracts. On a consolidated basis, float has grown from approximately \$84 billion at the end of 2014 to approximately \$129 billion at the end of 2019, primarily through internal growth. The cost of float can be measured as the net pre-tax underwriting loss as a percentage of average float. Over the past five years, with the exception of 2017, Berkshire's cost of float was negative, as its insurance businesses produced net underwriting gains.

Railroad Business—Burlington Northern Santa Fe

Burlington Northern Santa Fe, LLC ("BNSF") is based in Fort Worth, Texas, and through BNSF Railway Company ("BNSF Railway") operates one of the largest railroad systems in North America. BNSF Railway had approximately 40,750 employees at the end of 2019. BNSF also operates a relatively smaller third-party logistics services business.

In serving the Midwest, Pacific Northwest, Western, Southwestern and Southeastern regions and ports of the United States, BNSF transports a range of products and commodities derived from manufacturing, agricultural and natural resource industries. Freight revenues are covered by contractual agreements of varying durations or common carrier published prices or company quotations. BNSF's financial performance is influenced by, among other things, general and industry economic conditions at the international, national and regional levels.

BNSF's primary routes, including trackage rights, allow it to access major cities and ports in the western and southern United States as well as parts of Canada and Mexico. In addition to major cities and ports, BNSF Railway efficiently serves many smaller markets by working closely with approximately 200 shortline railroads. BNSF Railway has also entered into marketing agreements with other rail carriers, expanding the marketing reach for each railroad and their customers. For the year ending December 31, 2019, approximately 35% of freight revenues were derived from consumer products, 27% from industrial products, 21% from agricultural products and 17% from coal.

Regulatory Matters

BNSF is subject to federal, state and local laws and regulations generally applicable to its businesses. Rail operations are subject to the regulatory jurisdiction of the Surface Transportation Board ("STB") the Federal Railroad Administration of the United States Department of Transportation ("DOT"), the Occupational Safety and Health Administration ("OSHA"), as well as other federal and state regulatory agencies and Canadian regulatory agencies for operations in Canada. The STB has jurisdiction over disputes and complaints involving certain rates, routes and services, the sale or abandonment of rail lines, applications for line extensions and construction, and the merger with or acquisition of control of rail common carriers. The outcome of STB proceedings can affect the profitability of BNSF Railway's business.

The DOT and OSHA have jurisdiction under several federal statutes over a number of safety and health aspects of rail operations, including the transportation of hazardous materials. BNSF Railway is required to transport these materials to the extent of its common carrier obligation. State agencies regulate some aspects of rail operations with respect to health and safety in areas not otherwise preempted by federal law.

Environmental Matters

BNSF's rail operations, as well as those of its competitors, are also subject to extensive federal, state and local environmental regulation covering discharges to water, air emissions, toxic substances and the generation, handling, storage, transportation and disposal of waste and hazardous materials. Such regulations effectively increase the costs and liabilities associated with rail operations. Environmental risks are also inherent in rail operations, which frequently involve transporting chemicals and other hazardous materials.

Many of BNSF's land holdings are or have been used for industrial or transportation-related purposes or leased to commercial or industrial companies whose activities may have resulted in discharges onto the property. Under federal (in particular, the Comprehensive Environmental Response, Compensation and Liability Act) and state statutes, BNSF may be held jointly and severally liable for cleanup and enforcement costs associated with a particular site without regard to fault or the legality of the original conduct. BNSF may also be subject to claims by third parties for investigation, cleanup, restoration or other environmental costs under environmental statutes or common law with respect to properties they own that have been impacted by BNSF operations.

Competition

The business environment in which BNSF operates is highly competitive. Depending on the specific market, deregulated motor carriers and other railroads, as well as river barges, ships and pipelines, may exert pressure on price and service levels. The presence of advanced, high service truck lines with expedited delivery, subsidized infrastructure and minimal empty mileage continues to affect the market for non-bulk, time-sensitive freight. The potential expansion of longer combination vehicles could further encroach upon markets traditionally served by railroads. In order to remain competitive, BNSF and other railroads seek to develop and implement operating efficiencies to improve productivity.

As railroads streamline, rationalize and otherwise enhance their franchises, competition among rail carriers intensifies. BNSF Railway's primary rail competitor in the Western region of the United States is the Union Pacific Railroad Company. Other Class I railroads and numerous regional railroads and motor carriers also operate in parts of the same territories served by BNSF.

Utilities and Energy Businesses—Berkshire Hathaway Energy

Berkshire currently owns 90.9% of the outstanding common stock of Berkshire Hathaway Energy Company ("BHE"). BHE is a global energy company with subsidiaries that generate, transmit, store, distribute and supply energy. BHE's locally managed businesses are organized as separate operating units. BHE's domestic regulated energy interests are comprised of four regulated utility companies serving approximately 5.1 million retail customers, two interstate natural gas pipeline companies with approximately 16,300 miles of pipeline and a design capacity of approximately 8.5 billion cubic feet of natural gas per day and ownership interests in electricity transmission businesses. BHE's Great Britain electricity distribution subsidiaries serve about 3.9 million electricity end-users and its electricity transmission-only business in Alberta, Canada serves approximately 85% of Alberta's population. BHE's interests also include a diversified portfolio of independent power projects, the largest residential real estate brokerage firm in the United States, and one of the largest residential real estate brokerage franchise networks in the United States. BHE employs approximately 23,000 people in connection with its various operations.

General Matters

PacifiCorp is a regulated electric utility company headquartered in Oregon, serving electric customers in portions of Utah, Oregon, Wyoming, Washington, Idaho and California. The combined service territory's diverse regional economy ranges from rural, agricultural and mining areas to urban, manufacturing and government service centers. No single segment of the economy dominates the combined service territory, which helps mitigate PacifiCorp's exposure to economic fluctuations. In addition to retail sales, PacifiCorp sells electricity on a wholesale basis to other electricity retailers and wholesalers.

MidAmerican Energy Company ("MEC") is a regulated electric and natural gas utility company headquartered in Iowa, serving electric and natural gas customers primarily in Iowa and also in portions of Illinois, South Dakota and Nebraska. MEC has a diverse retail customer base consisting of urban and rural residential customers and a variety of commercial and industrial customers. In addition to retail sales and natural gas transportation, MEC sells electricity principally to markets operated by regional transmission organizations and natural gas on a wholesale basis.

NV Energy, Inc. ("NV Energy") is an energy holding company headquartered in Nevada, primarily consisting of two regulated utility subsidiaries, Nevada Power Company ("Nevada Power") and Sierra Pacific Power Company ("Sierra Pacific") (collectively, the "Nevada Utilities"). Nevada Power serves retail electric customers in southern Nevada and Sierra Pacific serves retail electric and natural gas customers in northern Nevada. The Nevada Utilities' combined service territory's economy includes gaming, mining, recreation, warehousing, manufacturing and governmental services. In addition to retail sales and natural gas transportation, the Nevada Utilities sell electricity and natural gas on a wholesale basis.

As vertically integrated utilities, BHE's domestic utilities own approximately 29,000 net megawatts of generation capacity in operation and under construction. The domestic utilities business is subject to seasonal variations principally related to the use of electricity for air conditioning and natural gas for heating. Typically, regulated electric revenues are higher in the summer months, while regulated natural gas revenues are higher in the winter months.

The Great Britain distribution companies consist of Northern Powergrid (Northeast) Limited and Northern Powergrid (Yorkshire) plc, which own a substantial electricity distribution network that delivers electricity to end-users in northeast England in an area covering approximately 10,000 square miles. The distribution companies primarily charge supply companies regulated tariffs for the use of their distribution systems.

AltaLink L.P. ("AltaLink") is a regulated electric transmission-only utility company headquartered in Calgary, Alberta. AltaLink's high voltage transmission lines and related facilities transmit electricity from generating facilities to major load centers, cities and large industrial plants throughout its 87,000 square mile service territory.

The natural gas pipelines consist of Northern Natural Gas Company ("Northern Natural") and Kern River Gas Transmission Company ("Kern River"). Northern Natural, based in Nebraska, owns the largest interstate natural gas pipeline system in the United States, as measured by pipeline miles, reaching from west Texas to Michigan's Upper Peninsula. Northern Natural's pipeline system consists of approximately 14,600 miles of natural gas pipelines. Northern Natural's extensive pipeline system, which is interconnected with many interstate and intrastate pipelines in the national grid system, has access to supplies from multiple major supply basins and provides transportation services to utilities and numerous other customers. Northern Natural also operates three underground natural gas storage facilities and two liquefied natural gas storage peaking units. Northern Natural's pipeline system experiences significant seasonal swings in demand and revenue, with the highest demand typically occurring during the months of November through March.

Kern River, based in Utah, owns an interstate natural gas pipeline system that consists of approximately 1,700 miles and extends from supply areas in the Rocky Mountains to consuming markets in Utah, Nevada and California. Kern River transports natural gas for electric and natural gas distribution utilities, major oil and natural gas companies or affiliates of such companies, electric generating companies, energy marketing and trading companies, and financial institutions.

BHE Renewables is based in Iowa and owns interests in independent power projects having approximately 4,600 net megawatts of generation capacity that are in service in California, Texas, Illinois, Nebraska, New York, Arizona, Minnesota, Kansas, Hawaii and the Philippines. These independent power projects sell power generated primarily from wind, solar, geothermal and hydro sources under long-term contracts. Additionally, BHE Renewables has invested over $3 billion in twenty-one wind projects sponsored by third parties, commonly referred to as tax equity investments.

Regulatory Matters

PacifiCorp, MEC and the Nevada Utilities are subject to comprehensive regulation by various federal, state and local agencies. The Federal Energy Regulatory Commission ("FERC") is an independent agency with broad authority to implement provisions of the Federal Power Act, the Natural Gas Act, the Energy Policy Act of 2005 and other federal statutes. The FERC regulates rates for wholesale sales of electricity; transmission of electricity, including pricing and regional planning for the expansion of transmission systems; electric system reliability; utility holding companies; accounting and records retention; securities issuances; construction and operation of hydroelectric facilities; and other matters. The FERC also has the enforcement authority to assess civil penalties of up to $1.3 million per day per violation of rules, regulations and orders issued under the Federal Power Act. MEC is also subject to regulation by the Nuclear Regulatory Commission pursuant to the Atomic Energy Act of 1954, as amended, with respect to its 25% ownership of the Quad Cities Nuclear Station.

With certain limited exceptions, BHE's domestic utilities have an exclusive right to serve retail customers within their service territories and, in turn, have an obligation to provide service to those customers. In some jurisdictions, certain classes of customers may choose to purchase all or a portion of their energy from alternative energy suppliers, and in some jurisdictions retail customers can generate all or a portion of their own energy. Historically, state regulatory commissions have established retail electric and natural gas rates on a cost-of-service basis, designed to allow a utility the opportunity to recover what each state regulatory commission deems to be the utility's reasonable costs of providing services, including a fair opportunity to earn a reasonable return on its investments based on its cost of debt and equity. The retail electric rates of PacifiCorp, MEC and the Nevada Utilities are generally based on the cost of providing traditional bundled services, including generation, transmission and distribution services; however, rates are available for transmission and distribution-only services.

Northern Powergrid (Northeast) and Northern Powergrid (Yorkshire) each charge fees for the use of their distribution systems that are controlled by a formula prescribed by the British electricity regulatory body, the Gas and Electricity Markets Authority. The current eight-year price control period runs from April 1, 2015 through March 31, 2023.

AltaLink is regulated by the Alberta Utilities Commission ("AUC"), pursuant to the Electric Utilities Act (Alberta), the Public Utilities Act (Alberta), the Alberta Utilities Commission Act (Alberta) and the Hydro and Electric Energy Act (Alberta). The AUC is an independent quasi-judicial agency, which regulates and oversees Alberta's electricity transmission sector with broad authority that may impact many of AltaLink's activities, including its tariffs, rates, construction, operations and financing. Under the Electric Utilities Act, AltaLink prepares and files applications with the AUC for approval of tariffs to be paid by the Alberta Electric System Operator ("AESO") for the use of its transmission facilities, and the terms and conditions governing the use of those facilities. The AESO is an independent system operator in Alberta, Canada that oversees Alberta's integrated electrical system ("AIES") and wholesale electricity market. The AESO is responsible for directing the safe, reliable and economic operation of the AIES, including long-term transmission system planning.

The natural gas pipelines are subject to regulation by various federal, state and local agencies. The natural gas pipeline and storage operations of Northern Natural and Kern River are regulated by the FERC pursuant to the Natural Gas Act and the Natural Gas Policy Act of 1978. Under this authority, the FERC regulates, among other items, (a) rates, charges, terms and conditions of service and (b) the construction and operation of interstate pipelines, storage and related facilities, including the extension, expansion or abandonment of such facilities. Interstate natural gas pipeline companies are also subject to regulations administered by the Office of Pipeline Safety within the Pipeline and Hazardous Materials Safety Administration, an agency within the DOT. Federal pipeline safety regulations are issued pursuant to the Natural Gas Pipeline Safety Act of 1968, as amended, which establishes safety requirements in the design, construction, operation and maintenance of interstate natural gas pipeline facilities.

Environmental Matters

BHE and its energy businesses are subject to federal, state, local and foreign laws and regulations regarding climate change, renewable portfolio standards, air and water quality, emissions performance standards, coal combustion byproduct disposal, hazardous and solid waste disposal, protected species and other environmental matters that have the potential to impact current and future operations. In addition to imposing continuing compliance obligations, these laws and regulations, such as the Federal Clean Air Act, provide regulators with the authority to levy substantial penalties for noncompliance, including fines, injunctive relief and other sanctions.

The Federal Clean Air Act, as well as state laws and regulations impacting air emissions, provides a framework for protecting and improving the nation's air quality and controlling sources of air emissions. These laws and regulations continue to be promulgated and implemented and will impact the operation of BHE's generating facilities and require them to reduce emissions at those facilities to comply with the requirements.

Renewable portfolio standards have been established by certain state governments and generally require electricity providers to obtain a minimum percentage of their power from renewable energy resources by a certain date. Utah, Oregon, Washington, California, Iowa and Nevada have adopted renewable portfolio standards. In addition, the potential adoption of state or federal clean energy standards, which include low-carbon, non-carbon and renewable electricity generating resources, may also impact electricity generators and natural gas providers.

In December 2015, an international agreement was negotiated by 195 nations to create a universal framework for coordinated action on climate change in what is referred to as the Paris Agreement. The Paris Agreement reaffirms the goal of limiting global temperature increase well below 2 degrees Celsius, while urging efforts to limit the increase to 1.5 degrees Celsius; establishes commitments by all parties to make nationally determined contributions and pursue domestic measures aimed at achieving the commitments; commits all countries to submit emissions inventories and report regularly on their emissions and progress made in implementing and achieving their nationally determined commitments; and commits all countries to submit new commitments every five years, with the expectation that the commitments will get more aggressive. In the context of the Paris Agreement, the United States agreed to reduce greenhouse gas emissions 26% to 28% by 2025 from 2005 levels. The Paris Agreement formally entered into force November 4, 2016. On June 1, 2017, President Trump announced the United States would begin the process of withdrawing from the Paris Agreement. Under the terms of the Paris Agreement, withdrawal cannot occur until four years after entry into force, making the United States' withdrawal effective in November 2020.

On October 10, 2017, the EPA issued a proposal to repeal the Clean Power Plan, which was intended to achieve an overall reduction in carbon dioxide emissions from existing fossil-fueled electric generating units of 32% below 2005 levels. On June 19, 2019, the EPA repealed the Clean Power Plan and issued the Affordable Clean Energy rule, which fully replaced the Clean Power Plan. In the Affordable Clean Energy rule, the EPA determined that the best system of emissions reduction for existing coal fueled power plants is heat rate improvements and identified a set of candidate technologies and measures that could improve heat rates. Measures taken to meet the standards of performance must be achieved at the source itself. The EPA's repeal and replacement of the Clean Power Plan is not expected to have a material impact on BHE and its energy subsidiaries. Increasingly, states are adopting legislation and regulations to reduce greenhouse gas emissions, and local governments and consumers are seeking increasing amounts of clean and renewable energy.

BHE and its energy subsidiaries continue to focus on delivering reliable, affordable, safe and clean energy to its customers and on actions to mitigate greenhouse gas emissions. For example, through December 31, 2019, BHE's cumulative investment in wind, solar, geothermal and biomass generation is approximately $29 billion.

Non-Energy Businesses

HomeServices of America, Inc. ("HomeServices") is the largest residential real estate brokerage firm in the United States. In addition to providing traditional residential real estate brokerage services, HomeServices offers other integrated real estate services, including mortgage originations and mortgage banking, title and closing services, property and casualty insurance, home warranties, relocation services and other home-related services. It operates under 47 brand names with over 43,000 real estate agents in over 900 brokerage offices in 30 states and the District of Columbia.

In October 2012, HomeServices acquired a 66.7% interest in one of the largest residential real estate brokerage franchise networks in the United States, which offers and sells independently owned and operated residential real estate brokerage franchises. In April 2018, HomeServices acquired the remaining 33.3% interest. HomeServices' franchise network currently includes approximately 380 franchisees in over 1,600 brokerage offices throughout the United States and Europe with nearly 53,000 real estate agents under two brand names. In exchange for certain fees, HomeServices provides the right to use the Berkshire Hathaway HomeServices or Real Living brand names and other related service marks, as well as providing orientation programs, training and consultation services, advertising programs and other services.

HomeServices' principal sources of revenue are dependent on residential real estate sales, which are generally higher in the second and third quarters of each year. This business is highly competitive and subject to general real estate market conditions.

Manufacturing Businesses

Berkshire's numerous and diverse manufacturing subsidiaries are grouped into three categories: (1) industrial products, (2) building products and (3) consumer products. Berkshire's industrial products businesses manufacture specialty chemicals, metal cutting tools, components for aerospace and power generation applications, and a variety of other products primarily for industrial use. The building products group produces prefabricated and site-built residential homes, flooring products, insulation, roofing and engineered products, building and engineered components, paint and coatings and bricks and masonry products. The consumer products group manufactures recreational vehicles, alkaline batteries, various apparel products, jewelry and custom picture framing products. Information concerning the major activities of these three groups follows.

Industrial products

Precision Castparts

Precision Castparts Corp. ("PCC") manufactures complex metal components and products, provides high-quality investment castings, forgings, fasteners/fastener systems and aerostructures for critical aerospace and power and energy applications. PCC also manufactures seamless pipe for coal-fired, industrial gas turbine ("IGT") and nuclear power plants; downhole casing and tubing, fittings and various mill forms in a variety of nickel and steel alloys for severe-service oil and gas environments; investment castings and forgings for general industrial, armament, medical and other applications; nickel and titanium alloys in all standard mill forms from large ingots and billets to plate, foil, sheet, strip, tubing, bar, rod, extruded shapes, rod-in-coil, wire and welding consumables, as well as cobalt alloys, for the aerospace, chemical processing, oil and gas, pollution control and other industries; revert management solutions; fasteners for automotive and general industrial markets; specialty alloys for the investment casting and forging industries; heat treating and destructive testing services for the investment cast products and forging industries; grinder pumps and affiliated components for low-pressure sewer systems; critical auxiliary equipment and gas monitoring systems for the power generation industry; and metalworking tools for the fastener market and other applications.

Investment casting technology involves a multi-step process that uses ceramic molds in the manufacture of metal components with more complex shapes, closer tolerances and finer surface finishes than parts manufactured using other methods. PCC uses this process to manufacture products for aircraft engines, IGT's and other aeroderivative engines, airframes, medical implants, armament, unmanned aerial vehicles and other industrial applications. PCC also manufactures high temperature carbon and ceramic composite components, including ceramic matrix composites, for use in next-generation aerospace engines.

PCC uses forging processes to manufacture components for the aerospace and power generation markets, including seamless pipe for coal-fired, industrial gas turbine and nuclear power plants, and downhole casings and tubing pipe for severe service oil and gas markets. PCC manufactures high-performance, nickel-based alloys used to produce forged components for aerospace and non-aerospace applications in such markets as oil and gas, chemical processing and pollution control. These titanium products are used to manufacture components for the commercial and military aerospace, power generation, energy, and other industrial end markets.

PCC is also a leading developer and manufacturer of highly engineered fasteners, fastener systems, aerostructures and precision components, primarily for critical aerospace applications. These products are produced for the aerospace and power and energy markets, as well as for construction, automotive, heavy truck, farm machinery, mining and construction equipment, shipbuilding, machine tools, medical equipment, appliances and recreation markets.

The majority of PCC's sales are from purchase orders or demand schedules pursuant to long-term agreements. Contractual terms may provide for termination by the customer, subject to payment for work performed. PCC typically does not experience significant order cancellations, although periodically it receives requests for delays in delivery schedules.

PCC is subject to substantial competition in all of its markets. Components and similar products may be produced by competitors, who use either the same types of manufacturing processes as PCC or other processes. Although PCC believes its manufacturing processes, technology and experience provide advantages to its customers, such as high quality, competitive prices and physical properties that often meet more stringent demands, alternative forms of manufacturing can be used to produce many of the same components and products. Despite intense competition, PCC is a leading supplier in most of its principal markets. Several factors, including long-standing customer relationships, technical expertise, state-of-the-art facilities and dedicated employees, aid PCC in maintaining competitive advantages.

Several raw materials used in PCC products, including certain metals such as nickel, titanium, cobalt, tantalum and molybdenum, are found in only a few parts of the world. These metals are required for the alloys used in manufactured products. The availability and costs of these metals may be influenced by private or governmental cartels, changes in world politics, labor relations between the metal producers and their work forces and inflation.

Lubrizol Corporation

The Lubrizol Corporation ("Lubrizol") is a specialty chemical company that produces and supplies technologies for the global transportation, industrial and consumer markets. Lubrizol currently operates in two business sectors: (1) Lubrizol Additives, which includes engine additives, driveline additives and industrial specialties products; and (2) Lubrizol Advanced Materials, which includes personal and home care, engineered polymers, performance coatings, skin care and life science solutions.

Lubrizol Additives products are used in a broad range of applications including engine oils, transmission fluids, gear oils, specialty driveline lubricants, fuel additives, metalworking fluids, compressor lubricants and greases for transportation and industrial applications. Lubrizol's Advanced Materials products are used in several different types of applications including over-the-counter pharmaceutical products, performance coatings, personal care products, sporting goods and plumbing and fire sprinkler systems. Lubrizol is an industry leader in many of the markets in which it competes. Lubrizol's principal additives competitors are Infineum International Ltd., Chevron Oronite Company and Afton Chemical Corporation. The advanced materials industry is highly fragmented with a variety of competitors in each product line.

From a base of approximately 3,800 patents, Lubrizol uses its technological leadership position in product development and formulation expertise to improve the quality, value and performance of its products, as well as to help minimize the environmental impact of those products. Lubrizol uses many specialty and commodity chemical raw materials in its manufacturing processes and uses base oil in processing and blending additives. Raw materials are primarily feedstocks derived from petroleum and petrochemicals and, generally, are obtainable from several sources. The materials that Lubrizol chooses to purchase from a single source typically are subject to long-term supply contracts to ensure supply reliability. Lubrizol operates facilities in 27 countries (including production facilities in 17 countries and laboratories in 14 countries).

Lubrizol markets its products worldwide through a direct sales organization and sales agents and distributors. Lubrizol's customers principally consist of major global and regional oil companies and industrial and consumer products companies that are located in more than 120 countries. Some of its largest customers also may be suppliers. In 2019, no single customer accounted for more than 10% of Lubrizol's consolidated revenues. Lubrizol continues to implement a multi-year phased investment plan to upgrade operations, ensure compliance with health, safety and environmental requirements and increase global manufacturing capacity.

Lubrizol is subject to foreign, federal, state and local laws to protect the environment and limit manufacturing waste and emissions. The company believes that its policies, practices and procedures are designed to limit the risk of environmental damage and consequent financial liability. Nevertheless, the operation of manufacturing plants entails ongoing environmental risks, and significant costs or liabilities could be incurred in the future.

IMC International Metalworking Companies

IMC International Metalworking Companies ("IMC") is one of the world's three largest multinational manufacturers of consumable precision carbide metal cutting tools for applications in a broad range of industrial end markets. IMC's principal brand names include *ISCAR®*, *TaeguTec®*, *Ingersoll®*, *Tungaloy®*, *Unitac®*, *UOP®*, *It.te.di*®, *Qutiltec*®, *Tool—Flo*® and *PCT*®. IMC's primary manufacturing facilities are located in Israel, the United States, Germany, Italy, France, Switzerland, South Korea, China, India, Japan and Brazil.

IMC has five primary product lines: milling tools, gripping tools, turning/thread tools, drilling tools and tooling. The main products are split within each product line between consumable cemented tungsten carbide inserts and steel tool holders. Inserts comprise the vast majority of sales and earnings. Metal cutting inserts are used by industrial manufacturers to cut metals and are consumed during their use in cutting applications. IMC manufactures hundreds of types of highly engineered inserts within each product line that are tailored to maximize productivity and meet the technical requirements of customers. IMC's staff of scientists and engineers continuously develop and innovate products that address end user needs and requirements.

IMC's global sales and marketing network operates in virtually every major manufacturing center around the world staffed with highly skilled engineers and technical personnel. IMC's customer base is very diverse, with its primary customers being large, multinational businesses in the automotive, aerospace, engineering and machinery industries. IMC operates a regional central warehouse system with locations in Israel, the United States, Belgium, Korea, Japan and Brazil. Additional small quantities of products are maintained at local IMC offices in order to provide on-time customer support and inventory management.

IMC competes in the metal cutting tools segment of the global metalworking tools market. The segment includes hundreds of participants who range from small, private manufacturers of specialized products for niche applications and markets to larger, global multinational businesses (such as Sandvik and Kennametal, Inc.) with a wide assortment of products and extensive distribution networks. Other manufacturing companies such as Kyocera, Mitsubishi, Sumitomo, Ceratizit and Korloy also play a significant role in the cutting tool market.

Marmon Holdings

Marmon Holdings, Inc. ("Marmon") is a global industrial organization comprising 11 diverse business sectors and more than 100 autonomous manufacturing and service businesses. Marmon acquired the Colson Medical Companies as of October 31, 2019, which comprise Marmon's Medical sector. Marmon's manufacturing and service operations employ over 22,000 employees at approximately 400 manufacturing, distribution, and service facilities located primarily in the United States, as well as 21 other countries worldwide. Marmon's business sectors are described as follows.

Foodservice Technologies manufactures beverage dispensing and cooling equipment, hot and cold food preparation and holding equipment and related products for restaurants, global brand owners and other foodservice providers. Operations are based in the U.S. with manufacturing in China, India, the U.K., Germany and Italy. Products are sold primarily throughout the U.S., Europe and Asia.

Water Technologies manufactures water treatment equipment for residential, commercial, and industrial applications worldwide. Operations are based primarily in the U.S., Canada, China, Singapore, India, and Mexico with business centers located in Belgium, France, Poland, Germany, the U.K., Italy, Switzerland and U.A.E.

Transportation Products serves the automotive, heavy-duty highway transportation, and aerospace industries with precision-molded plastic components; fastener thread solutions; metal tubing; auto aftermarket transmission and chassis products; platform trailers; and truck and trailer components. Operations and business are conducted primarily in the U.S., Mexico, Canada, Europe and Asia.

Retail Solutions provides retail environment design services; in-store digital merchandising and display fixtures; shopping, material handling, and security carts; and consumer products, including air compressors and extension cords. Operations and business are conducted in the U.S., the U.K., Czech Republic and China.

Metal Services provides specialty metal pipe, tubing, beams and related value-added services to customers across a broad range of industries. Operations are based in the U.S., Canada, and Mexico and business is conducted primarily in those countries.

Electrical produces electrical wire for use in residential and commercial buildings; and specialty wire and cable for use in energy, transit, aerospace, defense, communication and other industrial applications. Operations are based in the U.S., Canada, India and England. Business is conducted globally and primarily in the U.S., Canada, India, the U.K., U.A.E. and China.

Plumbing & Refrigeration supplies copper, aluminum, and stainless steel tubing and fittings for the plumbing, HVAC and refrigeration markets; custom coils for the HVAC market; and aluminum and brass forgings for many commercial and industrial applications. Business and operations are conducted primarily in the U.S.

Industrial Products supplies construction fasteners; gloves and other protective wear; gear drives, gearboxes, fan drives and pump drives for various markets; wind machines for agricultural use; and wheels, axles, and gears for rail, mining and other applications. Operations are primarily based in the U.S., Canada and China and business is conducted in those countries.

Rail & Leasing manufactures, leases and maintains railcars; leases intermodal tank containers; manufactures mobile railcar movers; provides in-plant rail switching and loading services; performs track construction and maintenance; and manufactures steel tank heads and cylinders.

Union Tank Car Company ("UTLX") is the largest component of Rail & Leasing and is a leading designer, builder and full-service lessor of railroad tank cars and other specialized railcars. Together with its Canadian affiliate Procor, UTLX owns a fleet of approximately 127,000 railcars for lease to customers in chemical, petrochemical, energy and agricultural/food industries. UTLX manufactures tank cars at two U.S. plants and performs railcar maintenance services at more than 100 locations across North America.

UTLX has a diversified customer base, both geographically and across industries. UTLX, while subject to cyclicality and significant competition in most of its markets, competes by offering a broad range of high-quality products and services targeted at its niche markets. Railcars are typically leased for multiple-year terms and most of the leases are renewed upon expiration. Due to selective ongoing capital investment, utilization rates (the number of railcars on lease to total available) of the railcar fleet are generally high.

Intermodal tank containers are leased through EXSIF Worldwide. EXSIF is a leading international lessor of intermodal tank containers with a fleet of approximately 65,000 units, primarily serving chemical producers and logistics operators.

Crane Services is a provider of mobile cranes and operators in North America and Australia. Sterling Crane, Joyce Crane, Freo Group, and WGC Cranes operate a combined fleet of approximately 1,200 cranes primarily serving the energy, mining and petrochemical markets.

Medical develops, manufactures and distributes a wide range of innovative medical devices in the extremities, trauma fixation, craniomaxillofacial, neurosurgery, biologics, aesthetics and powered instruments markets. The sector's leading-edge medical technology and products are used globally to help improve patient care and outcomes. Operations are based in the U.S., Europe and China. Business is conducted primarily in North and South America, Europe, Asia and Australia.

<u>Other industrial products</u>

CTB International Corp. ("CTB"), headquartered in Milford, Indiana, is a leading global designer, manufacturer and marketer of a wide range of agricultural systems and solutions for preserving grain, producing poultry, pigs and eggs, and for processing poultry, fish, vegetables and other foods. CTB operates from facilities located around the globe and supports customers through a worldwide network of independent distributors and dealers.

CTB competes with a variety of manufacturers and suppliers, many of which offer only a limited number of the products offered by CTB and two of which offer products across many of CTB's product lines. Competition is based on the price, value, reputation, quality and design of the products offered and the customer service provided by distributors, dealers and manufacturers of the products. CTB's leading brand names, distribution network, diversified product line, product support and high-quality products enable it to compete effectively. CTB manufactures its products primarily from galvanized steel, steel wire, stainless steel and polymer materials and supplies of these materials have been sufficient in recent years.

LiquidPower Specialty Products Inc. ("LSPI"), headquartered in Houston, Texas, is a global leader in the science of drag reduction application ("DRA') technology by maximizing the flow potential of pipelines, increasing operational flexibility and throughput capacity, and efficiencies for customers. LSPI develops innovative flow improver solutions with customers in over 40 countries on six continents, treating over 50 million barrels of hydrocarbon liquids per day. LSPI's DRA offering is part of a comprehensive, full-service solution that encompasses industry-leading technology, quality manufacturing, technical support and consulting, a reliable supply chain, injection equipment and field service. The Scott Fetzer companies are a group of businesses that manufacture, distribute, service and finance a wide variety of products for residential, industrial and institutional use.

Berkshire's industrial products manufacturers employ approximately 83,000 persons.

Building Products

<u>Clayton Homes</u>

Clayton Homes, Inc. ("Clayton"), headquartered near Knoxville, Tennessee, is a vertically integrated housing company offering traditional site-built homes and off-site built housing – including modular homes, manufactured homes, CrossMod™ homes and tiny homes. In 2019, Clayton delivered 44,600 off-site built and 7,369 site-built homes. Clayton also offers home financing and insurance products and competes on price, service, location and delivery capabilities.

All Clayton Built® off-site homes are designed, engineered and assembled in the United States. Clayton sells its homes through independent dealers, company owned home centers, realtors and subdivision channels. Clayton considers its ability to make financing available to retail purchasers a factor affecting the market acceptance of its off-site built homes. Clayton's financing programs utilize proprietary loan underwriting guidelines, which include ability to repay calculations, including debt to income limits, consideration of residual income and credit score requirements, which are considered in evaluating loan applicants.

Since 2015, Clayton's site-built division, Clayton Properties Group, has grown through nine builder acquisitions across 14 states with a total of 311 subdivisions, supplementing the portfolio of housing products offered to customers. Our site-builders currently control approximately 59,000 lots, with a home order backlog of approximately $1.0 billion.

Shaw Industries

Shaw Industries Group, Inc. ("Shaw"), headquartered in Dalton, Georgia, is a leading carpet manufacturer based on both revenue and volume of production. Shaw designs and manufactures over 3,700 styles of tufted carpet, wood and resilient flooring for residential and commercial use under about 30 brand and trade names and under certain private labels. Shaw also provides project management and installation services. Shaw's manufacturing operations are fully integrated from the processing of raw materials used to make fiber through the finishing of carpet. In 2018, Shaw acquired Sanquahar Tile Services in Scotland, which manufactures and distributes carpet tile throughout Europe. Shaw also manufactures or distributes a variety of hardwood, vinyl and laminate floor products ("hard surfaces"). In 2016, Shaw acquired USFloors, Inc., which is a leading innovator and marketer of wood-plastic composite luxury vinyl tile flooring, as well as cork, bamboo and hardwood products. Shaw's carpet and hard surface products are sold in a broad range of patterns, colors and textures. Shaw operates Shaw Sports Turf and Southwest Greens International, LLC, which provide synthetic sports turf, golf greens and landscape turf products.

Shaw products are sold wholesale to over 40,000 retailers, distributors and commercial users throughout the United States, Canada and Mexico and are also exported to various overseas markets. Shaw's wholesale products are marketed domestically by over 2,400 salaried and commissioned sales personnel directly to retailers and distributors and to large national accounts. Shaw's seven carpet, six hard surface, one sample full-service distribution facility and three sample satellite locations and thirty redistribution centers, along with centralized management information systems, enable it to provide prompt and efficient delivery of its products to both its retail customers and wholesale distributors.

Substantially all carpet manufactured by Shaw is tufted carpet made from nylon, polypropylene and polyester. In the tufting process, yarn is inserted by multiple needles into a synthetic backing, forming loops, which may be cut or left uncut, depending on the desired texture or construction. During 2019, Shaw processed approximately 95% of its requirements for carpet yarn in its own yarn processing facilities. The availability of raw materials continues to be adequate but costs are impacted by petro-chemical and natural gas price changes. Raw material cost changes are periodically factored into selling prices to customers.

The floor covering industry is highly competitive with more than 100 companies engaged in the manufacture and sale of carpet in the United States and numerous manufacturers engaged in hard surface floor covering production and sales. According to industry estimates, carpet accounts for approximately 45% of the total United States consumption of all flooring types. The principal competitive measures within the floor covering industry are quality, style, price and service.

Johns Manville

Johns Manville ("JM"), headquartered in Denver, Colorado, is a leading manufacturer and marketer of premium-quality products for building insulation, mechanical and industrial insulation, commercial roofing and roof insulation, as well as fibers and nonwovens for commercial, industrial and residential applications. JM serves markets that include aerospace, automotive and transportation, air handling, appliance, HVAC, pipe and equipment, filtration, waterproofing, building, flooring, interiors and wind energy. Fiberglass is the basic material in a majority of JM's products, although JM also manufactures a significant portion of its products with other materials to satisfy the broader needs of its customers. Raw materials are readily available in sufficient quantities from various sources for JM to maintain and expand its current production levels. JM regards its patents and licenses as valuable, however it does not consider any of its businesses to be materially dependent on any single patent or license. JM operates over 40 manufacturing facilities in North America, Europe and China and conducts research and development at its technical center in Littleton, Colorado and at other facilities in the U.S. and Europe.

Fiberglass is made from earthen raw materials and recycled glass, together with proprietary agents to bind many of its glass fibers. JM's products also contain materials other than fiberglass, including various chemical and petro-chemical-based materials used in roofing and other specialized products. JM uses recycled material when available and suitable to satisfy the broader needs of its customers. The raw materials used in these various products are readily available in sufficient quantities from various sources to maintain and expand its current production levels.

JM's operations are subject to a variety of federal, state and local environmental laws and regulations, which regulate the discharge of materials into the air, land and water and govern the use and disposal of hazardous substances. The most relevant of the federal laws are the Federal Clean Air Act, the Clean Water Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act and the Comprehensive Environmental Response, Compensation and Liability Act of 1980, which are administered by the EPA. Canadian, European and Asian regulatory authorities have also adopted their own environmental laws and regulations. JM continually monitors new and pending regulations and assesses their potential impact on the business.

JM sells its products through a wide variety of channels including contractors, distributors, retailers, manufacturers and fabricators. JM operates in highly competitive markets, with competitors comprised primarily of several large global and national manufacturers and smaller regional manufacturers. JM holds leadership positions in the key markets that it serves. JM's products compete primarily on value, differentiation and customization, and breadth of product line. Sales of JM's products are moderately seasonal due to increases in construction activity that typically occur in the second and third quarters of the calendar year. JM sees a marketplace trend in customer purchasing decisions being influenced by the sustainable and energy efficient attributes of its products, services and operations.

MiTek Industries, Inc.

MiTek Industries, Inc. ("MiTek"), based in Chesterfield, Missouri, operates in two separate markets: residential and commercial. MiTek operates worldwide with sales in over 100 countries and with manufacturing facilities and/or sales/engineering offices located in 21 countries.

In the residential segment, MiTek is a leading supplier of engineered connector products, construction hardware, engineering software and services and computer-driven manufacturing machinery to the truss component market of the building components industry. MiTek's primary customers are component manufacturers who manufacture prefabricated roof and floor trusses and wall panels for the residential building market. MiTek also sells construction hardware to commercial distributors and do-it-yourself retail stores.

MiTek's commercial businesses provide products and services sold to the commercial construction industry. Commercial products include curtain wall systems, masonry and stone anchoring systems, light gauge steel framing products, engineering services for a proprietary high-performance steel frame connection and a comprehensive range of ductwork for the ventilation market, customized air handling systems for commercial, institutional and industrial markets, design and supply of Nuclear Safety Related HVAC systems and components, energy recovery and dehumidification systems for commercial applications and pre-engineered and pre-fabricated custom structural mezzanines and platforms for distribution and manufacturing facilities.

A significant raw material used by MiTek is hot dipped galvanized sheet steel. While supplies are presently adequate, variations in supply have historically occurred, producing significant variations in cost and availability.

Benjamin Moore

Benjamin Moore & Co. ("Benjamin Moore"), headquartered in Montvale, New Jersey, is a leading formulator, manufacturer and retailer of a broad range of architectural coatings, available principally in the United States and Canada. Products include water-based and solvent-based general-purpose coatings (paints, stains and clear finishes) for use by consumers, contractors and industrial and commercial users. Products are marketed under various registered brand names, including, but not limited to: *Aura®, Natura®, Regal® Select*, *Ultra Spec®*, *ben®, Eco Spec®, Coronado®, Corotech®, Insl-x®, Lenmar®, Super Kote®, Arborcoat®, Super Hide®, Century®, SCUFF-X® and Notable®™*.

Benjamin Moore paints are available from over 3,300 independent retailers representing more than 5,000 locally owned and operated storefronts in the United States and Canada. The independent retailer channel offers a broad array of products including *Benjamin Moore®, Coronado®* and *Insl-x®* brands and other competitor coatings, wall coverings, window treatments and sundries.

Selected Benjamin Moore products are currently sold at approximately 1,000 Ace Hardware ("Ace") stores. In July 2019, Ace and Benjamin Moore announced that Ace was expanding its relationship with Benjamin Moore, by naming Benjamin Moore as the preferred paint supplier for approximately 3,300 Ace stores. Participating Ace stores will have the opportunity to carry a full line premium assortment of Benjamin Moore products or a streamlined offering of Regal® Select and ben®, or ben® only branded products beginning in the Spring of 2020. As part of the expanded relationship, Benjamin Moore will also assume responsibility for manufacturing Ace's private label paint brands, Clark+Kensington® and Royal®.

Benjamin Moore also operates an on-line "pick up in store" program, which allows consumers to place orders via an e-commerce site, or for national accounts and government agencies via its customer information center, for pick-up at the customer's nearest dealer.

Benjamin Moore competes with numerous manufacturers, distributors and paint, coatings and related products retailers. Product quality, product innovation, breadth of product line, technical expertise, service and price determine the competitive advantage. Competitors include other paint and decorating stores, mass merchandisers, home centers, independent hardware stores, hardware chains and manufacturer-operated direct outlets, such as Sherwin-Williams Company, PPG Industries, Inc., The Valspar Corporation, The Home Depot, Inc. and Lowe's Companies, Inc.

The most significant raw materials in Benjamin Moore products are titanium dioxide, monomers, polymers and pigments. Historically, these materials have been generally available, with pricing and availability subject to fluctuation.

Acme Brick

Acme Brick Company and its subsidiaries ("Acme"), headquartered in Fort Worth, Texas, manufactures and distributes clay bricks (*Acme Brick*®) and concrete block (*Featherlite*). In addition, Acme distributes a number of other building products of other manufacturers, including floor and wall tile, wood flooring and other masonry products. Products are sold primarily in the South Central and South Eastern United States through company-operated sales offices. Acme distributes products primarily to homebuilders and masonry and general contractors.

In 2018 and 2019, Acme commenced closing multiple underperforming manufacturing and sales facilities. Now complete, Acme operates 12 clay brick manufacturing sites located in four states, three concrete block facilities and a quarrying operation all located in Texas. The demand for Acme's products is seasonal, with higher sales in the warmer weather months, and is subject to the level of construction activity, which is cyclical. Acme also owns and leases properties and mineral rights that supply raw materials used in many of its manufactured products. Acme's raw materials supply is believed to be adequate.

The brick industry is subject to the Environmental Protection Agency ("EPA") Maximum Achievable Control Technology Standards ("MACT"). As required under the 1990 Clean Air Act, the EPA developed a list of source categories that require the development of National Emission Standards for Hazardous Air Pollutants ("NESHAP"), which are also referred to as MACT Standards ("Rule"). Key elements of the MACT Rule include emission limits established for certain hazardous air pollutants and acidic gases. Acme's brick plants are in compliance with the current Rule.

Berkshire's building products manufacturers employ approximately 57,500 people.

Consumer Products

Apparel

Fruit of the Loom ("FOL"), headquartered in Bowling Green, Kentucky, is primarily a manufacturer and distributor of basic apparel, underwear, casualwear, athletic apparel and sports equipment. Products under the *Fruit of the Loom*® and *JERZEES*® labels are primarily sold in the mass merchandise, mid-tier chains and wholesale markets. In the Vanity Fair Brands product line, *Vassarette*®, *Curvation*® and *Radiant*® by Vanity Fair are sold in the mass merchandise market, while *Vanity Fair*® and *Lily of France*® products are sold to mid-tier chains and department stores. FOL also markets and sells apparel, sports equipment and balls to team dealers and athletic apparel, sports equipment and balls to sporting goods retailers under the *Russell Athletic*® and *Spalding*® brands. Additionally, *Spalding*® markets and sells balls and sports equipment in the mass merchandise market and dollar store channels. In 2019, approximately 54% of FOL's sales were to five customers.

FOL generally performs its own knitting, cloth finishing, cutting, sewing and packaging for apparel. For the North American market, which is FOL's predominant sales region, the majority of FOL's cloth manufacturing is performed in Honduras. Labor-intensive cutting, sewing and packaging operations are located in Central America, the Caribbean and Vietnam. For the European market, products are either sourced from third-party contractors in Europe or Asia or sewn in Morocco from textiles internally produced in Morocco. Manufacturing of bras, athletic equipment, sporting goods and other athletic apparel lines are generally sourced from third-party contractors located primarily in Asia.

U.S. grown cotton and polyester fibers are the main raw materials used in the manufacturing of FOL's apparel products and are purchased from a limited number of third-party suppliers. In 2015, FOL entered into an eight-year agreement with one key supplier to provide the majority of FOL's yarn. Management currently believes there are readily available alternative sources of raw materials and yarn. However, if relationships with suppliers cannot be maintained or delays occur in obtaining alternative sources of supply, production could be adversely affected, which could have a corresponding adverse effect on results of operations. Additionally, raw materials are subject to price volatility caused by weather, supply conditions, government regulations, economic climate and other unpredictable factors. FOL has secured contracts to purchase cotton, either directly or through the yarn suppliers, to meet a large percentage of its production plans for 2020. FOL's markets are highly competitive, consisting of many domestic and foreign manufacturers and distributors. Competition is generally based upon product features, quality, customer service and price.

Garan, headquartered in New York, New York designs, manufactures, imports and sells apparel primarily for children, including boys, girls, toddlers and infants. Products are sold under its own trademark *Garanimals®* and customer private label brands. Garan conducts its business through operating subsidiaries located in the United States, Central America and Asia. Garan's products are sold through its distribution centers in the United States. Fechheimer Brothers manufactures, distributes and sells uniforms, principally for the public service and safety markets, including police, fire, postal and military markets. Fechheimer Brothers is based in Cincinnati, Ohio.

The BH Shoe Holdings Group, headquartered in Greenwich, Connecticut, manufactures and distributes work, rugged outdoor and casual shoes and western-style footwear under a number of brand names, including *Justin, Tony Lama®, Chippewa®, BØRN®, B•Ø•C®, Carolina®, EuroSofft, Söfft, Double-H Boots®, Nursemates®* and *Comfortiva®.* Brooks Sports, headquartered in Seattle, Washington, markets and sells performance running footwear and apparel to specialty and national retailers and directly to consumers under the *Brooks®* brand. A significant volume of the shoes sold by Berkshire's shoe businesses are manufactured or purchased from sources located outside the United States. Products are sold worldwide through a variety of channels including department stores, footwear chains, specialty stores, catalogs and the Internet, as well as through company-owned retail stores.

<u>Other consumer products</u>

Forest River, Inc. ("Forest River") is a manufacturer of recreational vehicles ("RV"), utility cargo trailers, buses and pontoon boats, headquartered in Elkhart, Indiana with products sold in the United States and Canada through an independent dealer network. Forest River has numerous manufacturing facilities located in six states. Forest River is a leading manufacturer of RVs with numerous brand names, including Forest River, Coachmen RV and Prime Time. Utility cargo trailers are sold under a variety of brand names. Buses are sold under several brand names, including Starcraft Bus. Pontoon boats are sold under the Berkshire, South Bay and Trifecta brand names. The RV industry is very competitive. Competition is based primarily on price, design, quality and service. The industry has consolidated over the past several years and is currently concentrated in a few companies, the largest of which had a market share of approximately 44% based on industry data as of November 2019. Forest River held a market share of approximately 35% at that time.

The Duracell Company ("Duracell'), headquartered in Chicago, Illinois, is a leading manufacturer of high-performance alkaline batteries. Duracell manufactures batteries in the U.S., Europe and China and provides a network of worldwide sales and distribution centers. Costco and Walmart are significant customers, representing approximately 24% of Duracell's annual revenue. There are several competitors in the battery manufacturing market with Duracell holding an approximately 32% market share of the global alkaline battery market. Management believes there are currently sufficient sources of raw materials available, which are primarily steel, zinc and manganese.

Albecca Inc. ("Albecca"), headquartered in Norcross, Georgia, operates in the U.S., Canada and 12 other countries, with products primarily under the *Larson-Juhl®* name. Albecca designs, manufactures and distributes a complete line of high quality, branded custom framing products, including wood and metal moulding, matboard, foamboard, glass and framing supplies. Complementary to its framing products, Albecca offers art printing and fulfillment services.

Richline Group, Inc., headquartered in New York, New York, operates five strategic business units: Richline Jewelry, Richline Digital, LeachGarner, Rio Grande and Inverness. Each business unit is a manufacturer and/or distributor of precious metal and non-precious metal products to specific target markets including large jewelry chains, department stores, shopping networks, mass merchandisers, e-commerce retailers and artisans plus worldwide manufacturers and wholesalers and the medical, electronic and aerospace industries.

Berkshire's consumer products manufacturers employ approximately 55,000 persons.

Service and Retailing Businesses

Service Businesses

Berkshire's service businesses provide grocery and foodservice distribution, professional aviation training programs, fractional aircraft ownership programs and distribution of electronic components. Other service businesses include franchising and servicing of quick service restaurants, media businesses (newspaper, television and information distribution), as well as logistics businesses. Berkshire's service businesses employ approximately 52,000 people. Information concerning these activities follows.

McLane Company

McLane Company, Inc. (“McLane”) provides wholesale distribution services in all 50 states to customers that include convenience stores, discount retailers, wholesale clubs, drug stores, military bases, quick service restaurants and casual dining restaurants. McLane provides wholesale distribution services to Walmart, which accounted for approximately 20% of McLane’s revenues in 2019. McLane’s other significant customers include 7-Eleven (approximately 12% of revenues) and Yum! Brands, (approximately 11% of revenues). A curtailment of purchasing by Walmart or its other significant customers could have a material adverse impact on McLane’s periodic revenues and earnings. McLane’s business model is based on a high volume of sales, rapid inventory turnover and stringent expense controls. Operations are currently divided into three business units: grocery distribution, foodservice distribution and beverage distribution.

McLane’s grocery distribution unit, based in Temple, Texas, maintains a dominant market share within the convenience store industry and serves most of the national convenience store chains and major oil company retail outlets. Grocery operations provide products to approximately 50,250 retail locations nationwide, including Walmart. McLane’s grocery distribution unit operates 25 distribution facilities in 20 states.

McLane’s foodservice distribution unit, based in Carrollton, Texas, focuses on serving the quick service and casual dining restaurant industry with high quality, timely-delivered products. Operations are conducted through 46 facilities in 22 states. The foodservice distribution unit services approximately 35,350 restaurants nationwide.

Through its subsidiaries, McLane also operates wholesale distributors of distilled spirits, wine and beer. The beverage unit operates as Empire Distributors and operations are conducted through 14 distribution centers in Georgia, North Carolina, Tennessee and Colorado. Empire Distributors services approximately 26,400 retail locations in the Southeastern United States and Colorado.

FlightSafety International

FlightSafety International Inc. (“FlightSafety”), headquartered at New York’s LaGuardia Airport, is an industry leading provider of professional aviation training services and flight simulation products. FlightSafety and FlightSafety Textron Aviation Training, a joint venture with Textron which began operations in 2019, provide high technology training to pilots, aircraft maintenance technicians, flight attendants and dispatchers who operate and support a wide variety of business, commercial and military aircraft. The training is provided using a large fleet of advanced full flight simulators at learning centers and training locations in the United States, Australia, Brazil, Canada, China, France, Hong Kong, India, Japan, the Netherlands, Norway, South Africa and the United Kingdom. The vast majority of the instructors, training programs and flight simulators are qualified by the United States Federal Aviation Administration and other aviation regulatory agencies around the world.

FlightSafety is also a leader in the design and manufacture of full flight simulators, visual systems, displays and other advanced technology training devices. This equipment is used to support FlightSafety training programs and is offered for sale to airlines and government and military organizations around the world. Manufacturing facilities are located in Oklahoma, Missouri and Texas. FlightSafety strives to maintain and manufacture simulators and develop courseware using state-of-the-art technology and invests in research and development as it builds new equipment and training programs.

NetJets

NetJets Inc. (“NetJets”) is the world’s leading provider of shared ownership programs for general aviation aircraft. NetJets’ global headquarters is located in Columbus, Ohio, with most of its logistical and flight operations based at John Glenn Columbus International Airport. NetJets’ European operations are based in Lisbon, Portugal. The shared ownership concept is designed to meet the travel needs of customers who require the scale, flexibility and access of a large fleet that whole aircraft ownership cannot deliver. In addition, shared ownership programs are available for corporate flight departments seeking to outsource their general aviation needs or add capacity for peak periods and for others that previously chartered aircraft.

With a focus on safety and service, NetJets’ programs are designed to offer customers guaranteed availability of aircraft, predictable operating costs and increased liquidity. NetJets’ shared aircraft ownership programs permit customers to acquire a specific percentage of a certain aircraft type and allows customers to utilize the aircraft for a specified number of flight hours annually. In addition, NetJets offers prepaid flight cards and other aviation solutions and services for aircraft management, customized aircraft sales and acquisition, ground support and flight operation services under a number of programs including NetJets Shares™, NetJets Leases™ and the Marquis Jet Card®.

NetJets is subject to the rules and regulations of the United States Federal Aviation Administration, the Portuguese Civil Aviation Authority and the European Aviation Safety Agency. Regulations address aircraft registration, maintenance requirements, pilot qualifications and airport operations, including flight planning and scheduling as well as security issues and other matters.

TTI, Inc.

TTI, Inc. (“TTI”), headquartered in Fort Worth, Texas, is a global specialty distributor of passive, interconnect, electromechanical, discrete, and semiconductor components used by customers in the manufacturing and assembling of electronic products. TTI’s customer base includes original equipment manufacturers, electronic manufacturing services, original design manufacturers, military and commercial customers, as well as design and system engineers. TTI’s distribution agreements with the industry’s leading suppliers allow it to uniquely leverage its product cost and to expand its business by providing new lines and products to its customers. TTI operates sales offices and distribution centers from more than 100 locations throughout North America, Europe, Asia and Israel.

TTI services a variety of industries including telecommunications, medical devices, computers and office equipment, military/aerospace, automotive and industrial electronics. TTI’s core customers include businesses in the design through production stages in the electronic component supply chain, which supports its high-volume business, and its Mouser subsidiary, which supports a broader base of customers with lower volume purchases through internet based marketing.

Other services

XTRA Corporation (“XTRA”), headquartered in St. Louis, Missouri, is a leading transportation equipment lessor operating under the XTRA Lease® brand name. XTRA manages a diverse fleet of approximately 84,000 units located at 48 facilities throughout the United States. The fleet includes over-the-road and storage trailers, chassis, temperature controlled vans and flatbed trailers. XTRA is one of the largest lessors (in terms of units available) of over-the-road trailers in North America. Transportation equipment customers lease equipment to cover cyclical, seasonal and geographic needs and as a substitute for purchasing equipment. Therefore, as a provider of marginal capacity to its customers, XTRA’s utilization rates and operating results tend to be cyclical. In addition, transportation providers often use leasing to maximize their asset utilization and reduce capital expenditures. By maintaining a large fleet, XTRA is able to provide customers with a broad selection of equipment and quick response times.

International Dairy Queen develops and services a worldwide system of over 7,000 franchised restaurants operating primarily under the names *DQ Grill and Chill®, Dairy Queen®* and *Orange Julius®* that offer various dairy desserts, beverages, prepared foods and blended fruit drinks. Business Wire provides electronic dissemination of full-text news releases to the media, online services and databases and the global investment community in 150 countries and in 45 languages. Approximately 97% of Business Wire’s revenues derive from its core news distribution business. CORT Business Services Corporation is a leading national provider of rental relocation services including rental furniture, accessories and related services in the “rent-to-rent” market of the furniture rental industry. The Buffalo News and BH Media Group, Inc. are publishers of 31 daily and 43 weekly newspapers. WPLG, Inc. is an ABC affiliate broadcast station in Miami, Florida and Charter Brokerage is a leading non-asset based third party logistics provider to the petroleum and chemical industries.

Retailing Businesses

Berkshire’s retailing businesses include automotive, home furnishings and several other operations that sell various consumer products to consumers. Information regarding each of these operations follows. Berkshire’s retailing businesses employ approximately 29,000 people.

Berkshire Hathaway Automotive

The Berkshire Hathaway Automotive Group, Inc. (“BHA”) is one of the largest automotive retailers in the United States, currently operating 106 new vehicle franchises through 82 dealerships located primarily in major metropolitan markets in the United States. The dealerships sell new and used vehicles, vehicle maintenance and repair services, extended service contracts, vehicle protection products and other aftermarket products. BHA also arranges financing for its customers through third-party lenders. BHA operates 29 collision centers directly connected to the dealerships’ operations and owns and operates two auto auctions and a fluid maintenance products distribution company.

Dealership operations are highly concentrated in the Arizona and Texas markets, with approximately 70% of dealership-related revenues derived from sales in these markets. BHA currently maintains franchise agreements with 27 different vehicle manufacturers, although it derives a significant portion of its revenue from the Toyota/Lexus, General Motors, Ford/Lincoln, Nissan/Infiniti and Honda/Acura brands. Approximately 90% of BHA’s annual revenues are from dealerships representing these manufacturers.

The retail automotive industry is highly competitive. BHA faces competition from other large public and private dealership groups, as well as individual franchised dealerships and competition via the Internet. Given the pricing transparency available via the Internet, and the fact that franchised dealers acquire vehicles from the manufacturers on the same terms irrespective of volume, the location and quality of the dealership facility, customer service and transaction speed are key differentiators in attracting customers.

BHA's overall relationships with the automobile manufacturers are governed by framework agreements. The framework agreements contain provisions relating to the management, operation, acquisition and the ownership structure of BHA's dealerships. Failure to meet the terms of these agreements could adversely impact BHA's ability to acquire additional dealerships representing those manufacturers. Additionally, these agreements contain limitations on the number of dealerships from a specific manufacturer that may be owned by BHA.

Individual dealerships operate under franchise agreements with the manufacturer, which grants the dealership entity a non-exclusive right to sell the manufacturer's brand of vehicles and offer related parts and service within a specified market area, as well as the right to use the manufacturer's trademarks. The agreements contain various requirements and restrictions related to the management and operation of the franchised dealership and provide for termination of the agreement by the manufacturer or non-renewal for a variety of causes. The states generally have automotive dealership franchise laws that provide substantial protection to the franchisee, and it is difficult for a manufacturer to terminate or not renew a franchise agreement outside of bankruptcy or with "good cause" under the applicable state franchise law.

BHA also develops, underwrites and administers various vehicle protection plans as well as life and accident and health insurance plans sold to consumers through BHA's dealerships and third-party dealerships. BHA also develops proprietary training programs and materials and provides ongoing monitoring and training of the dealership's finance and insurance personnel.

<u>Home furnishings retailing</u>

The home furnishings businesses consist of Nebraska Furniture Mart ("NFM"), R.C. Willey Home Furnishings ("R.C. Willey"), Star Furniture Company ("Star") and Jordan's Furniture, Inc. ("Jordan's"). These businesses offer a wide selection of furniture, bedding and accessories. In addition, NFM and R.C. Willey sell a full line of major household appliances, electronics, computers and other home furnishings and offer customer financing to complement their retail operations. An important feature of each of these businesses is their ability to control costs and to produce high business volume by offering significant value to their customers.

NFM operates its business from four retail complexes with almost 4.5 million square feet of retail, warehouse and administrative facilities located in Omaha, Nebraska, Clive, Iowa, Kansas City, Kansas and The Colony, Texas. NFM also owns Homemakers Furniture located in Clive, Iowa, which has approximately 600,000 square feet of retail, warehouse and administrative space. NFM is the largest furniture retailer in each of these markets. R.C. Willey, based in Salt Lake City, Utah, currently operates 12 full-line retail home furnishings stores and three distribution centers. These facilities include approximately 1.5 million square feet of retail space with six stores located in Utah, one store in Meridian, Idaho, three stores in Nevada (Las Vegas and Reno) and two stores in the Sacramento, California area.

Jordan's operates a retail furniture business from six locations with approximately 770,000 square feet of retail space in stores located in Massachusetts, New Hampshire, Rhode Island and Connecticut. The retail stores are supported by an 800,000 square foot distribution center in Taunton, Massachusetts. Jordan's is the largest furniture retailer, as measured by sales, in Massachusetts and New Hampshire. Jordan's is well known in its markets for its unique store arrangements and advertising campaigns. Star has operated home furnishings retail store business in Texas for many years. Star's retail facilities currently include about 700,000 square feet of retail space in 11 locations in Texas, including eight in Houston.

<u>Other retailing</u>

Borsheim Jewelry Company, Inc. ("Borsheims") operates from a single store in Omaha, Nebraska. Borsheims is a high-volume retailer of fine jewelry, watches, crystal, china, stemware, flatware, gifts and collectibles. Helzberg's Diamond Shops, Inc. ("Helzberg") is based in North Kansas City, Missouri, and operates a chain of 222 retail jewelry stores in 36 states, which includes approximately 500,000 square feet of retail space. Helzberg's stores are located in malls, lifestyle centers, power strip centers and outlet malls, and all stores operate under the name *Helzberg Diamonds*® or *Helzberg Diamonds Outlet*®. The Ben Bridge Corporation ("Ben Bridge Jeweler"), based in Seattle, Washington, operates a chain of 90 retail jewelry stores located primarily in major shopping malls in 11 western states and in British Columbia, Canada. Forty-six of its retail locations are upscale jewelry stores selling loose diamonds, finished jewelry and high-end timepieces. Forty-four of its retail locations are concept stores operating under a franchise agreement that sell only Pandora jewelry.

See's Candies ("See's") produces boxed chocolates and other confectionery products with an emphasis on quality and distinctiveness in two large kitchens in Los Angeles and San Francisco and one smaller facility in Burlingame, California. See's operates approximately 250 retail and quantity discount stores located mainly in California and other Western states, as well as over 140 seasonal kiosk locations. See's revenues are highly seasonal with nearly half of its annual revenues earned in the fourth quarter.

The Pampered Chef, Ltd. ("Pampered Chef") is a premier direct seller of distinctive high-quality kitchenware products with sales and operations in the United States, Canada, Germany and Austria and operations in China. Pampered Chef's product portfolio consists of approximately 400 Pampered Chef® branded kitchenware items in categories ranging from stoneware and cutlery to grilling and entertaining. Pampered Chef's products are available through its sales force of independent cooking consultants and online.

Oriental Trading Company ("OTC") is a leading multi-channel retailer and online destination for value-priced party supplies, arts and crafts, toys and novelties, school supplies, educational games, patient giveaways and personalized products. OTC, headquartered in Omaha, Nebraska, serves a broad base of nearly four million customers annually, including consumers, schools, churches, non-profit organizations, medical and dental offices and other businesses. OTC offers a unique assortment of over 53,000 fun products on its websites, including its flagship orientaltrading.com site and utilizes sophisticated digital and print marketing efforts to drive significant traffic and industry leading customer satisfaction.

Detlev Louis Motorrad ("Louis"), headquartered in Hamburg, Germany, is a leading retailer of motorcycle apparel and equipment in Europe. Louis carries over 32,000 different products from more than 600 manufacturers, primarily covering the clothing, technical equipment and leisure markets. Louis has over 80 stores in Germany, Austria, Switzerland and the Netherlands and also sells through catalogs and via the Internet throughout most of Europe.

Additional information with respect to Berkshire's businesses

Revenue, earnings before taxes and identifiable assets attributable to Berkshire's reportable business segments are included in Note 27 to Berkshire's Consolidated Financial Statements contained in Item 8, Financial Statements and Supplementary Data. Additional information regarding Berkshire's investments in fixed maturity and equity securities is included in Notes 3 and 4, respectively, to Berkshire's Consolidated Financial Statements.

Berkshire owns 26.6% of the outstanding common stock of The Kraft Heinz Company ("Kraft Heinz"). Kraft Heinz is one of the largest food and beverage companies in the world, with sales in numerous countries within developed and emerging markets and territories. Kraft Heinz manufactures and markets food and beverage products, including condiments and sauces, cheese and dairy meals, meats, refreshment beverages, coffee and other grocery products, throughout the world, under a diverse mix of iconic and emerging brands. Berkshire subsidiaries also own a 50% joint venture interest in Berkadia Commercial Mortgage LLC ("Berkadia"), a 38.6% interest in Pilot Travel Centers LLC ("Pilot") and a 50% joint venture interest in Electric Transmission Texas, LLC ("ETT"). Information concerning these investments is included in Note 5 to Berkshire's Consolidated Financial Statements.

Berkshire maintains a website (*http://www.berkshirehathaway.com*) where its annual reports, certain corporate governance documents, press releases, interim shareholder reports and links to its subsidiaries' websites can be found. Berkshire's periodic reports filed with the SEC, which include Form 10-K, Form 10-Q, Form 8-K and amendments thereto, may be accessed by the public free of charge from the SEC and through Berkshire. Electronic copies of these reports can be accessed at the SEC's website (*http://www.sec.gov*) and indirectly through Berkshire's website (*http://www.berkshirehathaway.com*). Copies of these reports may also be obtained, free of charge, upon written request to: Berkshire Hathaway Inc., 3555 Farnam Street, Omaha, NE 68131, Attn: Corporate Secretary.

Item 1A. Risk Factors

Berkshire and its subsidiaries (referred to herein as "we," "us," "our" or similar expressions) are subject to certain risks and uncertainties in its business operations which are described below. The risks and uncertainties described below are not the only risks we face. Additional risks and uncertainties that are presently unknown or are currently deemed immaterial may also impair our business operations.

We are dependent on a few key people for our major investment and capital allocation decisions.

Major investment decisions and all major capital allocation decisions are made by Warren E. Buffett, Chairman of the Board of Directors and Chief Executive Officer, age 89, in consultation with Charles T. Munger, Vice Chairman of the Board of Directors, age 96. If for any reason the services of our key personnel, particularly Mr. Buffett, were to become unavailable, there could be a material adverse effect on our operations. However, Berkshire's Board of Directors has identified certain current Berkshire managers who, in their judgment, are capable of succeeding Mr. Buffett and has agreed on a replacement for Mr. Buffett should a replacement be needed currently. The Board continually monitors this risk and could alter its current view regarding a replacement for Mr. Buffett in the future. We believe that the Board's succession plan, together with the outstanding managers running our numerous and highly diversified operating units helps to mitigate this risk. In 2018, Berkshire's Board of Directors appointed Mr. Gregory Abel as Vice Chairman of Berkshire's non-insurance operations and Mr. Ajit Jain as Vice Chairman of Berkshire's insurance operations. Mr. Abel and Mr. Jain each report directly to Mr. Buffett and Mr. Buffett continues to be responsible for major capital allocation and investment decisions.

We need qualified personnel to manage and operate our various businesses.

In our decentralized business model, we need qualified and competent management to direct day-to-day business activities of our operating subsidiaries and to manage changes in future business operations due to changing business or regulatory environments. Our operating subsidiaries also need qualified and competent personnel in executing their business plans and serving their customers, suppliers and other stakeholders. Our inability to recruit and retain qualified and competent managers and personnel could negatively affect the operating results, financial condition and liquidity of our subsidiaries and Berkshire as a whole.

Investments are unusually concentrated in equity securities and fair values are subject to loss in value.

We concentrate a high percentage of the investments of our insurance subsidiaries in a relatively small number of equity securities and diversify our investment portfolios far less than is conventional in the insurance industry. A significant decline in the fair values of our larger investments in equity securities may produce a material decline in our consolidated shareholders' equity and our consolidated earnings.

Since a large percentage of our equity securities are held by our insurance subsidiaries, significant decreases in the fair values of these investments will produce significant declines in their statutory surplus. Our large statutory surplus is a competitive advantage, and a long-term material decline could have an adverse effect on our claims-paying ability ratings and our ability to write new insurance business thus potentially reducing our future underwriting profits.

Over ten years ago, we assumed the risk of potentially significant losses under a number of equity index put option contracts, which contain equity price risks. Most of the contracts remaining at year end 2019 will expire by February 2023. Risks of losses under these contracts are based on declines in equity prices of stocks comprising certain major U.S. and international stock indexes. We received considerable cash premiums as compensation for accepting these risks. Absent major reductions in future equity securities prices, our ultimate payment obligations are not likely to be significant. Nevertheless, there can be no assurance that equity securities prices will not decline significantly resulting in significant settlement payments upon contract expirations.

Competition and technology may erode our business franchises and result in lower earnings.

Each of our operating businesses face intense competition within markets in which they operate. While we manage our businesses with the objective of achieving long-term sustainable growth by developing and strengthening competitive advantages, many factors, including technological changes, may erode or prevent the strengthening of competitive advantages. Accordingly, our future operating results will depend to some degree on our operating units successfully protecting and enhancing their competitive advantages. If our operating businesses are unsuccessful in these efforts, our periodic operating results in the future may decline.

Deterioration of general economic conditions may significantly reduce our operating earnings and impair our ability to access capital markets at a reasonable cost.

Our operating businesses are subject to normal economic cycles, which affect the general economy or the specific industries in which they operate. Significant deteriorations of economic conditions over a prolonged period could produce a material adverse effect on one or more of our significant operations. In addition, our utilities and energy businesses and our railroad business regularly utilize debt as a component of their capital structures, and depend on having access to borrowed funds through the capital markets at reasonable rates. To the extent that access to the capital markets is restricted or the cost of funding increases, these operations could be adversely affected.

Terrorist acts could hurt our operating businesses.

A cyber, biological, nuclear or chemical attack could produce significant losses to our worldwide operations. Our business operations could be adversely affected from such acts through the loss of human resources or destruction of production facilities and information systems. We share the risk with all businesses.

Regulatory changes may adversely impact our future operating results.

Over time, in response to financial markets crises, global economic recessions, and social and environmental issues, regulatory initiatives were adopted in the United States and elsewhere. Such initiatives addressed for example, the regulation of banks and other major financial institutions and environmental and global-warming matters. These initiatives impact all of our businesses, albeit in varying ways. Increased regulatory compliance costs could have a significant negative impact on our operating businesses, as well as on the businesses in which we have a significant, but not controlling economic interests. We cannot predict whether such initiatives will have a material adverse impact on our consolidated financial position, results of operations and/or cash flows.

Data privacy regulations have recently been enacted in various jurisdictions in the U.S. and throughout the world. These regulations address numerous aspects related to the security of personal information that is stored in our information systems, networks and facilities. Failure to comply with these regulations could result in reputational damage and significant penalties.

Cyber security risks

We rely on technology in virtually all aspects of our business. Like those of many large businesses, certain of our information systems have been subject to computer viruses, malicious codes, unauthorized access, phishing efforts, denial-of-service attacks and other cyber-attacks and we expect to be subject to similar attacks in the future as such attacks become more sophisticated and frequent. A significant disruption or failure of our technology systems could result in service interruptions, safety failures, security events, regulatory compliance failures, an inability to protect information and assets against unauthorized users and other operational difficulties. Attacks perpetrated against our systems could result in loss of assets and critical information and expose us to remediation costs and reputational damage.

Although we have taken steps intended to mitigate these risks, including business continuity planning, disaster recovery planning and business impact analysis, a significant disruption or cyber intrusion could adversely affect our results of operations, financial condition and liquidity. Additionally, if we are unable to acquire, develop, implement, adopt or protect rights around new technology, we may suffer a competitive disadvantage, which could also have an adverse effect on our results of operations, financial condition and/or liquidity.

Cyber-attacks could further adversely affect our ability to operate facilities, information technology and business systems, or compromise confidential customer and employee information. Political, economic, social or financial market instability or damage to or interference with our operating assets, customers or suppliers from cyber-attacks may result in business interruptions, lost revenues, higher commodity prices, disruption in fuel supplies, lower energy consumption, unstable markets, increased security, repair or other costs, or may materially adversely affect us in ways that cannot be predicted at this time. Any of these risks could materially affect our consolidated financial results. Furthermore, instability in the financial markets resulting from terrorism, sustained or significant cyber-attacks, or war could also have a material adverse effect on our ability to raise capital. We share these risks with all businesses.

Risks unique to our regulated businesses

Our tolerance for risk in our insurance businesses may result in significant underwriting losses.

When properly paid for the risk assumed, we have been and will continue to be willing to assume more risk from a single event than any other insurer has knowingly assumed. Accordingly, we could incur a significant loss from a single catastrophe event resulting from a natural disaster or man-made catastrophes such as terrorism or cyber-attacks. We employ various disciplined underwriting practices intended to mitigate potential losses and attempt to take into account all possible correlations and avoid writing groups of policies from which pre-tax losses from a single catastrophe event might aggregate above $10 billion. Currently, we estimate that our aggregate exposure from a single event under outstanding policies is significantly below $10 billion. However, despite our efforts, it is possible that losses could manifest in ways that we do not anticipate and that our risk mitigation strategies are not designed to address. Additionally, various provisions of our policies, such as limitations or exclusions from coverage, negotiated to limit our risks, may not be enforceable in the manner we intend. Our tolerance for significant insurance losses may result in lower reported earnings in a future period.

The degree of estimation error inherent in the process of estimating property and casualty insurance loss reserves may result in significant underwriting losses.

The principal cost associated with the property and casualty insurance business is claims. In writing property and casualty insurance policies, we receive premiums today and promise to pay covered losses in the future. However, it will take decades before all claims that have occurred as of any given balance sheet date will be reported and settled. Although we believe that liabilities for unpaid losses are adequate, we will not know whether these liabilities or the premiums charged for the coverages provided were sufficient until well after the balance sheet date. Estimating insurance claim costs is inherently imprecise. Our estimated unpaid losses arising under contracts covering property and casualty insurance risks are large ($115.5 billion at December 31, 2019), and a small percentage increase to those liabilities can result in materially lower reported earnings.

Changes in regulations and regulatory actions can adversely affect our operating results and our ability to allocate capital.

Our insurance businesses are subject to regulation in the jurisdictions in which we operate. Such regulations may relate to among other things, the types of business that can be written, the rates that can be charged for coverage, the level of capital that must be maintained, and restrictions on the types and size of investments that can be made. Regulations may also restrict the timing and amount of dividend payments to Berkshire by these businesses. U.S. state insurance regulators and international insurance regulators are also actively developing various regulatory mechanisms to address the regulation of large internationally active insurance groups, including regulations concerning group capital, liquidity, governance and risk management. Accordingly, changes in regulations related to these or other matters or regulatory actions imposing restrictions on our insurance businesses may adversely impact our results of operations and restrict our ability to allocate capital.

Our railroad business conducted through BNSF is also subject to a significant number of laws and regulations with respect to rates and practices, taxes, railroad operations and a variety of health, safety, labor, environmental and other matters. Failure to comply with applicable laws and regulations could have a material adverse effect on BNSF's business. Governments may change the legislative and/or regulatory framework within which BNSF operates, without providing any recourse for any adverse effects that the change may have on the business. For example, federal legislation, enacted in 2008 and amended in 2015, mandated the implementation of positive train control technology by December 31, 2020, on certain mainline track where inter-city and commuter passenger railroads operate and where toxic-by-inhalation ("TIH") hazardous materials are transported. Complying with legislative and regulatory changes may pose significant operating and implementation risks and require significant capital expenditures.

BNSF derives significant amounts of revenue from the transportation of energy-related commodities, particularly coal. To the extent that changes in government policies limit or restrict the usage of coal as a source of fuel in generating electricity or alternate fuels, such as natural gas, displace coal on a competitive basis, revenues and earnings could be adversely affected. As a common carrier, BNSF is also required to transport TIH chemicals and other hazardous materials. A release of hazardous materials could expose BNSF to significant claims, losses, penalties and environmental remediation obligations. Changes in the regulation of the rail industry could negatively impact BNSF's ability to determine prices for rail services and to make capital improvements to its rail network, resulting in an adverse effect on our results of operations, financial condition and/or liquidity.

Our utilities and energy businesses operated under BHE are highly regulated by numerous federal, state, local and foreign governmental authorities in the jurisdictions in which they operate. These laws and regulations are complex, dynamic and subject to new interpretations or change. Regulations affect almost every aspect of our utilities and energy businesses. Regulations broadly apply and may limit management's ability to independently make and implement decisions regarding numerous matters including: acquiring businesses; constructing, acquiring or disposing of operating assets; operating and maintaining generating facilities and transmission and distribution system assets; complying with pipeline safety and integrity and environmental requirements; setting rates charged to customers; establishing capital structures and issuing debt; transacting between our domestic utilities and our other subsidiaries and affiliates; and paying dividends or similar distributions. Failure to comply with or reinterpretations of existing regulations and new legislation or regulations, such as those relating to air and water quality, renewable portfolio standards, emissions performance standards, climate change, coal combustion byproduct disposal, hazardous and solid waste disposal, protected species and other environmental matters, or changes in the nature of the regulatory process may have a significant adverse impact on our financial results.

Our railroad business requires significant ongoing capital investment to improve and maintain its railroad network so that transportation services can be safely and reliably provided to customers on a timely basis. Our utilities and energy businesses also require significant amounts of capital to construct, operate and maintain generation, transmission and distribution systems to meet their customers' needs and reliability criteria. Additionally, system assets may need to be operational for long periods of time in order to justify the financial investment. The risk of operational or financial failure of capital projects is not necessarily recoverable through rates that are charged to customers. Further, a significant portion of costs of capital improvements may be funded through debt issued by BNSF and BHE and their subsidiaries. Disruptions in debt capital markets that restrict access to funding when needed could adversely affect the results of operations, liquidity and/or capital resources of these businesses.

Item 1B. Unresolved Staff Comments

None.

Item 2. Description of Properties

The properties used by Berkshire's business segments are summarized in this section. Berkshire's railroad and utilities and energy businesses, in particular, utilize considerable physical assets in their businesses.

Railroad Business—Burlington Northern Santa Fe

Through BNSF Railway, BNSF operates approximately 32,500 route miles of track (excluding multiple main tracks, yard tracks and sidings) in 28 states, and also operates in three Canadian provinces. BNSF owns over 23,000 route miles, including easements, and operates over 9,000 route miles of trackage rights that permit BNSF to operate its trains with its crews over other railroads' tracks. As of December 31, 2019, the total BNSF Railway system, including single and multiple main tracks, yard tracks and sidings, consisted of over 50,000 operated miles of track.

BNSF operates various facilities and equipment to support its transportation system, including its infrastructure, locomotives and freight cars. It also owns or leases other equipment to support rail operations, such as vehicles. Support facilities for rail operations include yards and terminals throughout its rail network, system locomotive shops to perform locomotive servicing and maintenance, a centralized network operations center for train dispatching and network operations monitoring and management, regional dispatching centers, computers, telecommunications equipment, signal systems and other support systems. Transfer facilities are maintained for rail-to-rail as well as intermodal transfer of containers, trailers and other freight traffic and include approximately 25 intermodal hubs located across the system. BNSF owns or holds under non-cancelable leases exceeding one year approximately 8,000 locomotives and 70,000 freight cars, in addition to maintenance of way and other equipment.

In the ordinary course of business, BNSF incurs significant costs in repairing and maintaining its properties. In 2019, BNSF recorded approximately $2 billion in repairs and maintenance expense.

Utilities and Energy Businesses—Berkshire Hathaway Energy

BHE's energy properties consist of the physical assets necessary to support its electricity and natural gas businesses. Properties of BHE's electricity businesses include electric generation, transmission and distribution facilities, as well as coal mining assets that support certain of BHE's electric generating facilities. Properties of BHE's natural gas businesses include natural gas distribution facilities, interstate pipelines, storage facilities, compressor stations and meter stations. The transmission and distribution assets are primarily within each of BHE's utility service territories. In addition to these physical assets, BHE has rights-of-way, mineral rights and water rights that enable BHE to utilize its facilities. Pursuant to separate financing agreements, the majority of these properties are pledged or encumbered to support or otherwise provide the security for the related subsidiary debt. BHE or its affiliates own or have interests in the following types of operating electric generating facilities at December 31, 2019:

Energy Source	Entity	Location by Significance	Facility Net Capacity (MW) (1)	Net Owned Capacity (MW) (1)
Natural gas	PacifiCorp, MEC, NV Energy and BHE Renewables	Nevada, Utah, Iowa, Illinois, Washington, Oregon, Texas, New York, Arizona and Wyoming	10,938	10,659
Coal	PacifiCorp, MEC and NV Energy	Wyoming, Iowa, Utah, Arizona, Nevada, Colorado and Montana	13,641	8,593
Wind	PacifiCorp, MEC and BHE Renewables	Iowa, Wyoming, Texas, Nebraska, Washington, California, Illinois, Oregon and Kansas	8,883	8,883
Solar	BHE Renewables and NV Energy	California, Texas, Arizona, Minnesota and Nevada	1,699	1,551
Hydroelectric	PacifiCorp, MEC and BHE Renewables	Washington, Oregon, The Philippines, Idaho, California, Utah, Hawaii, Montana, Illinois and Wyoming	1,299	1,277
Nuclear	MEC	Illinois	1,821	455
Geothermal	PacifiCorp and BHE Renewables	California and Utah	377	377
		Total	38,658	31,795

(1) *Facility Net Capacity in megawatts (MW) represents the lesser of nominal ratings or any limitations under applicable interconnection, power purchase, or other agreements for intermittent resources and the total net dependable capability available during summer conditions for all other units. An intermittent resource's nominal rating is the manufacturer's contractually specified capability (in MW) under specified conditions. Net Owned Capacity indicates BHE's ownership of Facility Net Capacity.*

As of December 31, 2019, BHE's subsidiaries also have electric generating facilities that are under construction in Iowa, Wyoming and Montana having total Facility Net Capacity and Net Owned Capacity of 1,816 MW.

PacifiCorp, MEC and NV Energy own electric transmission and distribution systems, including approximately 25,200 miles of transmission lines and approximately 1,690 substations, gas distribution facilities, including approximately 27,500 miles of gas mains and service lines.

The electricity distribution network of Northern Powergrid (Northeast) and Northern Powergrid (Yorkshire) includes approximately 17,400 miles of overhead lines, approximately 42,300 miles of underground cables and approximately 770 major substations. AltaLink's electricity transmission system includes approximately 8,200 miles of transmission lines and approximately 310 substations.

Northern Natural's pipeline system consists of approximately 14,600 miles of natural gas pipelines, including approximately 6,100 miles of mainline transmission pipelines and approximately 8,500 miles of branch and lateral pipelines. Northern Natural's end-use and distribution market area includes points in Iowa, Nebraska, Minnesota, Wisconsin, South Dakota, Michigan and Illinois and its natural gas supply and delivery service area includes points in Kansas, Texas, Oklahoma and New Mexico. Storage services are provided through the operation of one underground natural gas storage field in Iowa, two underground natural gas storage facilities in Kansas and two liquefied natural gas storage peaking units, one in Iowa and one in Minnesota.

Kern River's system consists of approximately 1,700 miles of natural gas pipelines, including approximately 1,400 miles of mainline section, including 100 miles of lateral pipelines, and approximately 300 miles of common facilities. Kern River owns the entire mainline section, which extends from the system's point of origination in Wyoming through the Central Rocky Mountains into California.

Other Segments

Material physical properties used by Berkshire's other significant business segments are summarized below:

				Number of Properties	
Business	**Country**	**Locations**	**Property/ Facility type**	**Owned**	**Leased**
Insurance:					
GEICO	U.S.		Offices and claims centers	10	117
BHRG	U.S.		Offices	1	29
	Non-U.S.	Locations in 18 countries	Offices	1	33
BH Primary	U.S.		Offices	7	48
	Non-U.S.	Locations in 7 countries	Offices	—	12
Manufacturing	U.S.		Manufacturing facility	499	114
			Offices/ Warehouses	200	403
			Retail/ Showroom	228	225
			Housing communities	311	—
	Non-U.S.	Locations in 64 countries	Manufacturing facility	233	138
			Offices/ Warehouses	71	468
			Retail/ Showroom	—	10
Service	U.S.		Training facilities/ Hangars	20	139
			Offices/ Distribution	55	178
			Production facilities	23	3
			Leasing/ Showroom/ Retail	28	59
	Non-U.S.	Locations in 35 countries	Training facilities/ Hangars	17	14
			Offices/ Distribution	1	33
McLane Company	U.S.		Distribution centers	57	28
			Offices	4	2
Retailing	U.S.			30	26

		Offices/ Warehouses		
		Retail/ Showroom	141	563
Non-U.S.	Locations in 6 countries	Offices/ Warehouses	1	8
		Retail/ Offices	—	93

Item 3. Legal Proceedings

Berkshire and its subsidiaries are parties in a variety of legal actions that routinely arise out of the normal course of business, including legal actions seeking to establish liability directly through insurance contracts or indirectly through reinsurance contracts issued by Berkshire subsidiaries. Plaintiffs occasionally seek punitive or exemplary damages. We do not believe that such normal and routine litigation will have a material effect on our financial condition or results of operations. Berkshire and certain of its subsidiaries are also involved in other kinds of legal actions, some of which assert or may assert claims or seek to impose fines and penalties. We believe that any liability that may arise as a result of other pending legal actions will not have a material effect on our consolidated financial condition or results of operations.

Item 4. Mine Safety Disclosures

Information regarding the Company's mine safety violations and other legal matters disclosed in accordance with Section 1503 (a) of the Dodd-Frank Reform Act is included in Exhibit 95 to this Form 10-K.

Executive Officers of the Registrant

Following is a list of the Registrant's named executive officers:

Name	Age	Position with Registrant	Since
Warren E. Buffett	89	Chairman and Chief Executive Officer	1970
Charles T. Munger	96	Vice Chairman	1978
Gregory E. Abel	57	Vice Chairman – Non-Insurance Operations	2018
Ajit Jain	68	Vice Chairman – Insurance Operations	2018
Marc D. Hamburg	70	Senior Vice-President – Chief Financial Officer	1992

Each executive officer serves, in accordance with the by-laws of the Registrant, until the first meeting of the Board of Directors following the next annual meeting of shareholders and until a successor is chosen and qualified or until such executive officer sooner dies, resigns, is removed or becomes disqualified.

FORWARD-LOOKING STATEMENTS

Investors are cautioned that certain statements contained in this document as well as some statements in periodic press releases and some oral statements of Berkshire officials during presentations about Berkshire or its subsidiaries are "forward-looking" statements within the meaning of the Private Securities Litigation Reform Act of 1995 (the "Act"). Forward-looking statements include statements which are predictive in nature, which depend upon or refer to future events or conditions, which include words such as "expects," "anticipates," "intends," "plans," "believes," "estimates" or similar expressions. In addition, any statements concerning future financial performance (including future revenues, earnings or growth rates), ongoing business strategies or prospects and possible future Berkshire actions, which may be provided by management, are also forward-looking statements as defined by the Act. Forward-looking statements are based on current expectations and projections about future events and are subject to risks, uncertainties and assumptions about Berkshire and its subsidiaries, economic and market factors and the industries in which we do business, among other things. These statements are not guarantees of future performance and we have no specific intention to update these statements.

Actual events and results may differ materially from those expressed or forecasted in forward-looking statements due to a number of factors. The principal risk factors that could cause our actual performance and future events and actions to differ materially from such forward-looking statements include, but are not limited to, changes in market prices of our investments in fixed maturity and equity securities, losses realized from derivative contracts, the occurrence of one or more catastrophic events, such as an earthquake, hurricane, act of terrorism or cyber attack that causes losses insured by our insurance subsidiaries and/or losses to our business operations, changes in laws or regulations affecting our insurance, railroad, utilities and energy and finance subsidiaries, changes in federal income tax laws, and changes in general economic and market factors that affect the prices of securities or the industries in which we do business.

Part II

Item 5. Market for Registrant's Common Equity, Related Security Holder Matters and Issuer Purchases of Equity Securities

Market Information

Berkshire's Class A and Class B common stock are listed for trading on the New York Stock Exchange, trading symbols: BRK.A and BRK.B, respectively.

Shareholders

Berkshire had approximately 1,750 record holders of its Class A common stock and 19,200 record holders of its Class B common stock at February 13, 2020. Record owners included nominees holding at least 411,000 shares of Class A common stock and 1,405,000,000 shares of Class B common stock on behalf of beneficial-but-not-of-record owners.

Dividends

Berkshire has not declared a cash dividend since 1967.

Common Stock Repurchase Program

For several years, Berkshire had a common stock repurchase program, which permitted Berkshire to repurchase its Class A and Class B shares at prices no higher than a 20% premium over the book value of the shares. In 2018, Berkshire's Board of Directors authorized an amendment to the program, permitting Berkshire to repurchase shares any time that Warren Buffett, Berkshire's Chairman of the Board and Chief Executive Officer, and Charles Munger, Vice Chairman of the Board, believe that the repurchase price is below Berkshire's intrinsic value, conservatively determined. Repurchases may be in the open market or through privately negotiated transactions. Information with respect to Berkshire's Class A and Class B common stock repurchased during the fourth quarter of 2019 follows.

Period	Total number of shares purchased	Average price paid per share	Total number of shares purchased as part of publicly announced program	Maximum number or value of shares that yet may be repurchased under the program
October 1 through October 9:				
Class A common stock	688	$306,086.60	688	*
Class B common stock	1,497,623	$ 204.07	1,497,623	*
November 11 through November 29:				
Class A common stock	1,326	$328,974.91	1,326	*
Class B common stock	3,657,884	$ 218.62	3,657,884	*
December 2 through December 31:				
Class A common stock	674	$333,298.06	674	*
Class B common stock	953,070	$ 221.67	953,070	*

* *The program does not specify a maximum number of shares to be repurchased or obligate Berkshire to repurchase any specific dollar amount or number of Class A or Class B shares and there is no expiration date to the repurchase program. Berkshire will not repurchase its common stock if the repurchases reduce the total value of Berkshire's consolidated cash, cash equivalents and U.S. Treasury Bills holdings to less than $20 billion.*

Market for Registrant's Common Equity, Related Security Holder Matters and Issuer Purchases of Equity Securities *(Continued)*

Stock Performance Graph

The following chart compares the subsequent value of $100 invested in Berkshire common stock on December 31, 2014 with a similar investment in the Standard & Poor's 500 Stock Index and in the Standard & Poor's Property – Casualty Insurance Index.**

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* *Cumulative return for the Standard & Poor's indices based on reinvestment of dividends.*

** *It would be difficult to develop a peer group of companies similar to Berkshire. The Corporation owns subsidiaries engaged in a number of diverse business activities of which the most important is the property and casualty insurance business and, accordingly, management has used the Standard & Poor's Property—Casualty Insurance Index for comparative purposes.*

Item 6. Selected Financial Data

Selected Financial Data for the Past Five Years

(dollars in millions except per-share data)

	2019	2018	2017	2016	2015
Revenues:					
Insurance premiums earned	$ 61,078	$ 57,418	$ 60,597	$ 45,881	$ 41,294
Sales and service revenues	134,989	133,336	130,243	123,053	110,811
Leasing revenue	5,856	5,732	2,552	2,553	1,546
Railroad, utilities and energy revenues	43,453	43,673	40,005	37,447	39,923
Interest, dividend and other investment income	9,240	7,678	6,536	6,180	6,867
Total revenues	$ 254,616	$ 247,837	$ 239,933	$ 215,114	$ 200,441
Investment and derivative gains/losses	$ 72,607	$ (22,455)	$ 2,128	$ 8,304	$ 10,347
Earnings:					
Net earnings attributable to Berkshire Hathaway (1)	$ 81,417	$ 4,021	$ 44,940	$ 24,074	$ 24,083
Net earnings per share attributable to Berkshire Hathaway shareholders (2)	$ 49,828	$ 2,446	$ 27,326	$ 14,645	$ 14,656
Year-end data:					
Total assets	$ 817,729	$ 707,794	$ 702,095	$ 620,854	$ 552,257
Notes payable and other borrowings:					
Insurance and other	37,590	34,975	40,409	42,559	26,550
Railroad, utilities and energy	65,778	62,515	62,178	59,085	57,739
Berkshire Hathaway shareholders’ equity	424,791	348,703	348,296	282,070	254,619
Class A equivalent common shares outstanding, in thousands	1,625	1,641	1,645	1,644	1,643
Berkshire Hathaway shareholders’ equity per outstanding Class A equivalent common share	$ 261,417	$ 212,503	$ 211,750	$ 171,542	$ 154,935

(1) *Includes after-tax investment and derivative gains/losses of $57.4 billion in 2019, $(17.7) billion in 2018, $1.4 billion in 2017, $6.5 billion in 2016 and $6.7 billion in 2015. Beginning in 2018, investment gains/losses include the changes in fair values of equity securities during the period. Previously, investment gains/losses of equity securities were recognized in earnings when securities were sold or were other-than-temporarily impaired. Net earnings in 2017 includes a one-time net benefit of $29.1 billion attributable to the enactment of the Tax Cuts and Jobs Act of 2017.*

(2) *Represents net earnings per average equivalent Class A share outstanding. Net earnings per average equivalent Class B common share outstanding is equal to 1/1,500 of such amount.*

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

Results of Operations

Net earnings attributable to Berkshire Hathaway shareholders for each of the past three years are disaggregated in the table that follows. Amounts are after deducting income taxes and exclude earnings attributable to noncontrolling interests (in millions).

	2019	2018	2017
Insurance – underwriting	$ 325	$ 1,566	$ (2,219)
Insurance – investment income	5,530	4,554	3,887
Railroad	5,481	5,219	3,959
Utilities and energy	2,840	2,621	2,033
Manufacturing, service and retailing	9,372	9,364	7,282
Investment and derivative gains/losses	57,445	(17,737)	1,377
Other	424	(1,566)	(485)
Tax Cuts and Jobs Act of 2017	—	—	29,106
Net earnings attributable to Berkshire Hathaway shareholders	$ 81,417	$ 4,021	$ 44,940

Through our subsidiaries, we engage in a number of diverse business activities. We manage our operating businesses on an unusually decentralized basis. There are essentially no centralized or integrated business functions and there is minimal involvement by our corporate headquarters in the day-to-day business activities of the operating businesses. Our senior corporate management team participates in and is ultimately responsible for significant capital allocation decisions, investment activities and the selection of the Chief Executive to head each of the operating businesses. The business segment data (Note 27 to the accompanying Consolidated Financial Statements) should be read in conjunction with this discussion.

Beginning in 2018, our periodic net earnings include changes in unrealized gains and losses on our investments in equity securities. These gains and losses have been very significant given the size of our holdings and the inherent volatility in securities prices, producing extraordinary volatility in our reported net earnings for 2019 and 2018. Prior to 2018, the changes in unrealized gains and losses pertaining to such investments were recorded in other comprehensive income. The new accounting treatment has no effect on our consolidated shareholders' equity.

Net earnings in 2017 included approximately $29.1 billion attributable to a one-time net benefit from the enactment of the Tax Cuts and Jobs Act of 2017 ("TCJA") on December 22, 2017. This benefit included approximately $29.6 billion related to a one-time non-cash reduction of net deferred income tax liabilities from the reduction in the statutory U.S. corporate income tax rate from 35% to 21%, and a net benefit of approximately $900 million primarily attributable to our earnings from Kraft Heinz, partly offset by a one-time income tax expense of approximately $1.4 billion on the deemed repatriation of certain accumulated undistributed earnings of foreign subsidiaries. Due to the significance, we presented these one-time effects as a distinct item in the preceding table. Accordingly, the after-tax figures presented for 2017 in the discussion of our various operating businesses and other activities exclude the one-time effects of the TCJA.

After-tax earnings of our business operations in 2019 and 2018 were favorably affected by lower U.S. income tax expense compared to 2017, primarily attributable to a reduction in the statutory U.S. corporate income tax rate from 35% to 21%. The effect of the lower U.S. statutory income tax rate on the comparative after-tax earnings of our various business operations varied, reflecting the differences in the mix of earnings subject to income tax, income tax credits and the effects of state and local income taxes.

Our insurance businesses generated after-tax earnings from underwriting of $325 million in 2019 compared to earnings of $1.6 billion in 2018 and after-tax losses of approximately $2.2 billion in 2017. Insurance underwriting results included after-tax losses from significant catastrophe events of approximately $800 million in 2019, $1.3 billion in 2018 and $1.95 billion in 2017. Earnings from primary insurance operations were lower in 2019 and losses from reinsurance were higher than in 2018. After-tax underwriting earnings in 2019 included lower earnings from reductions of estimated ultimate liabilities for prior years' property/casualty loss events as compared to 2018 and losses of $92 million from foreign currency exchange rate changes on certain non-U.S. Dollar denominated liabilities of U.S. subsidiaries. Underwriting results included after-tax foreign currency exchange rate gains of $207 million in 2018 and losses of $295 million in 2017.

After-tax earnings from insurance investment income in 2019 increased 21.4% over 2018, which increased 17.2% over 2017. These increases reflected increases in interest and dividend income.

Results of Operations *(Continued)*

After-tax earnings of our railroad business increased 5.0% in 2019 compared to 2018. Earnings in 2019 benefitted from higher rates per car/unit, a curtailment gain related to an amendment to defined benefit retirement plans and ongoing operating cost control initiatives, partly offset by lower freight volumes and incremental costs associated with the persistent flooding conditions and severe winter weather in the first half of the year. All key routes impacted by flooding resumed service by the third quarter. Our railroad business generated a 31.8% increase in after-tax earnings in 2018 compared to 2017, reflecting an increase in unit volume, higher average revenue per car/unit and a lower effective income tax rate, partly offset by increased fuel and other operating costs.

After-tax earnings of our utilities and energy business increased 8.4% in 2019 compared to 2018 as all businesses produced higher earnings in 2019 versus 2018. Our utilities and energy businesses produced higher after-tax earnings in 2018 compared to 2017, primarily due to the effects of losses incurred in 2017 in connection with the prepayment of certain long-term debt, increased earnings at the natural gas pipelines and other energy businesses and the TCJA income tax benefits recognized in 2018.

Earnings from our manufacturing, service and retailing businesses were relatively unchanged from 2018. Operating results of our manufacturing, service and retailing businesses in 2019 were mixed, with several of these businesses experiencing lower earnings in 2019 from a variety of factors. Revenues and pre-tax earnings in 2019 of certain of these businesses were negatively affected by the unfavorable effects of foreign currency translation attributable to a stronger U.S. Dollar, international trade tensions and U.S. trade tariffs. After-tax earnings in 2018 of our manufacturing, service and retailing businesses increased 29% over 2017, due to lower effective income tax rates and a 13% increase in pre-tax earnings.

Investment and derivative gains/losses in 2019 and 2018 included significant unrealized gains and losses from market price changes on our holdings of equity securities. After-tax unrealized gains on equity securities were approximately $53.7 billion in 2019 compared to after-tax losses of $20.6 billion in 2018. After-tax investment gains in 2019 also included after-tax realized gains on sales of equity and fixed maturity securities of $2.6 billion compared to $3.1 billion in 2018. We believe that investment and derivative gains/losses, whether realized from dispositions or unrealized from changes in market prices of equity securities, are generally meaningless in understanding our reported results or evaluating the economic performance of our businesses. These gains and losses have caused and will continue to cause significant volatility in our periodic earnings.

After-tax other earnings included equity method investment earnings of $1.0 billion in 2019, losses of $1.4 billion in 2018 and earnings of $1.1 billion in 2017. The losses in 2018 were attributable to Kraft Heinz, partly offset by earnings from other equity method investments. Other earnings also included foreign currency exchange rate gains of $58 million in 2019, $289 million in 2018, and losses of $655 million in 2017 related to non-U.S. Dollar denominated debt issued by Berkshire and its U.S. based financing subsidiary, Berkshire Hathaway Finance Corporation ("BHFC").

Insurance—Underwriting

Our management views our insurance businesses as possessing two distinct activities – underwriting and investing. Underwriting decisions are the responsibility of the unit managers, while investing decisions are the responsibility of Berkshire's Chairman and CEO, Warren E. Buffett and Berkshire's corporate investment managers. Accordingly, we evaluate performance of underwriting operations without any allocation of investment income or investment gains/losses. We consider investment income as a component of our aggregate insurance operating results. However, we consider investment gains and losses, whether realized or unrealized as non-operating, based on our long-held strategy of acquiring securities and holding those securities for long periods. We believe that such gains and losses are not meaningful in understanding the operating results of our insurance operations.

The timing and amount of catastrophe losses can produce significant volatility in our periodic underwriting results, particularly with respect to our reinsurance businesses. Generally, we consider pre-tax catastrophe losses in excess of $100 million from a current year event as significant. We incurred estimated pre-tax losses of approximately $1.0 billion in 2019, $1.6 billion in 2018 and $3.0 billion in 2017 from significant catastrophe events.

Changes in estimates for unpaid losses and loss adjustment expenses, including amounts established for occurrences in prior years, can also significantly affect our periodic underwriting results. Unpaid loss estimates, including estimates under retroactive reinsurance contracts, were approximately $115.5 billion as of December 31, 2019. Our periodic underwriting results may also include significant foreign currency transaction gains and losses arising from the changes in the valuation of non-U.S. Dollar denominated reinsurance liabilities of our U.S. based insurance subsidiaries due to foreign currency exchange rate fluctuations.

Insurance—Underwriting *(Continued)*

We engage in both primary insurance and reinsurance of property/casualty, life and health risks. In primary insurance activities, we assume defined portions of the risks of loss from persons or organizations that are directly subject to the risks. In reinsurance activities, we assume defined portions of similar or dissimilar risks that other insurers or reinsurers have subjected themselves to in their own insuring activities. Our insurance and reinsurance businesses are GEICO, Berkshire Hathaway Primary Group and Berkshire Hathaway Reinsurance Group ("BHRG").

Underwriting results of our insurance businesses are summarized below (dollars in millions).

	2019	2018	2017
Underwriting gain (loss):			
GEICO	$ 1,506	$ 2,449	$ (310)
Berkshire Hathaway Primary Group	383	670	719
Berkshire Hathaway Reinsurance Group	(1,472)	(1,109)	(3,648)
Pre-tax underwriting gain (loss)	417	2,010	(3,239)
Income taxes and noncontrolling interests	92	444	(1,020)
Net underwriting gain (loss)	$ 325	$ 1,566	$ (2,219)
Effective income tax rate	24.2%	21.4%	32.0%

GEICO

GEICO writes private passenger automobile insurance, offering coverages to insureds in all 50 states and the District of Columbia. GEICO markets its policies mainly by direct response methods where most customers apply for coverage directly to the company via the Internet or over the telephone. A summary of GEICO's underwriting results follows (dollars in millions).

	2019		2018		2017	
	Amount	%	Amount	%	Amount	%
Premiums written	$ 36,016		$ 34,123		$ 30,547	
Premiums earned	$ 35,572	100.0	$ 33,363	100.0	$ 29,441	100.0
Losses and loss adjustment expenses	28,937	81.3	26,278	78.8	25,497	86.6
Underwriting expenses	5,129	14.5	4,636	13.9	4,254	14.5
Total losses and expenses	34,066	95.8	30,914	92.7	29,751	101.1
Pre-tax underwriting gain (loss)	$ 1,506		$ 2,449		$ (310)	

2019 versus 2018

Premiums written and earned in 2019 increased 5.5% and 6.6%, respectively, compared to 2018. These increases were primarily attributable to voluntary auto policies-in-force growth of 6.4% over the past twelve months, partially offset by a decrease in average premiums per auto policy due to coverage changes and changes in state and risk mix. The increase in voluntary auto policies-in-force primarily resulted from an increase in new business sales of 10.9% and a decrease in the number of policies not renewed. Voluntary auto policies-in-force increased approximately 1,068,000 during 2019.

Losses and loss adjustment expenses in 2019 increased 10.1% to $28.9 billion. GEICO's losses and loss adjustment expenses ratio in 2019 was 81.3%, an increase of 2.5 percentage points over 2018. The loss ratio increase in 2019 reflected continuing increases in loss severities, slightly offset by lower storm-related losses.

Claims frequencies in 2019 declined compared to 2018 for property damage and collision coverages (two to four percent range) and personal injury protection coverage (one to two percent range) and were relatively unchanged for bodily injury coverage. Average claims severities in 2019 were higher versus 2018 for property damage and collision coverages (four to six percent range) and bodily injury coverage (seven to nine percent range).

Losses and loss adjustment expenses regularly include changes in the ultimate claim loss estimates during the period for prior years' loss events, which produce pre-tax underwriting earnings or losses in the period of the change. GEICO increased ultimate claim loss estimates for prior years' loss events by $42 million in 2019 compared to a decrease of $222 million in 2018.

Insurance—Underwriting *(Continued)*

GEICO (Continued)

Underwriting expenses in 2019 were $5.1 billion, an increase of $493 million (10.6%) over 2018. GEICO's underwriting expense ratio in 2019 was 14.5%, an increase of 0.6 percentage points compared to 2018. The underwriting expense increase was primarily attributable to increases in advertising expenses and employee-related costs, which reflected wage and staffing increases.

2018 versus 2017

Premiums written were $34.1 billion in 2018, an increase of 11.7% compared to 2017. The increase reflected voluntary auto policies-in-force growth of 3.3% and increased premiums per auto policy of approximately 6.4%. The increase in premiums per policy was attributable to rate increases, coverage changes and changes in state and risk mix. The rate increases were in response to accelerating claim costs in previous years. Although policies-in-force increased 540,000 during 2018, the rate of increase slowed, as voluntary auto new business sales decreased 4.7% compared to 2017.

Losses and loss adjustment expenses in 2018 were $26.3 billion, an increase of $781 million (3.1%) compared to 2017. GEICO's losses and loss adjustment expenses ratio for 2018 was 78.8%, a decline of 7.8 percentage points compared to 2017. Losses from significant catastrophe events were $105 million in 2018 (Hurricanes Florence and Michael and the wildfires in California) and approximately $450 million in 2017 (Hurricanes Harvey and Irma). GEICO reduced ultimate claim loss estimates for prior years' loss events by $222 million in 2018 and increased estimated prior year ultimate liabilities by $517 million in 2017.

Claims frequencies in 2018 for property damage, collision, and bodily and personal injury protection coverages declined (two to four percent range) compared to 2017. Average claims severities in 2018 increased for property damage and collision coverages (four to six percent range) and bodily injury coverage (five to seven percent range) versus 2017.

Underwriting expenses in 2018 were approximately $4.6 billion, an increase of $382 million (9.0%) over 2017. GEICO's underwriting expense ratio in 2018 was 13.9%, a decrease of 0.6 percentage points compared to 2017. The underwriting expense increase was primarily attributable to increases in advertising expenses, insurance premium taxes and employee-related costs, which reflected wage and staffing increases.

Berkshire Hathaway Primary Group

The Berkshire Hathaway Primary Group ("BH Primary") provides a variety of commercial insurance solutions, including healthcare malpractice, workers' compensation, automobile, general liability, property and various specialty coverages for small, medium and large clients. The largest of these insurers are Berkshire Hathaway Specialty Insurance ("BH Specialty"), Berkshire Hathaway Homestate Companies ("BHHC"), MedPro Group, Berkshire Hathaway GUARD Insurance Companies ("GUARD"), and National Indemnity Company ("NICO Primary"). Other BH Primary insurers include U.S. Liability Insurance Company, Applied Underwriters (sold in October 2019), Central States Indemnity Company and MLMIC Insurance Company, acquired October 1, 2018. A summary of BH Primary underwriting results follows (dollars in millions).

	2019		2018		2017	
	Amount	**%**	**Amount**	**%**	**Amount**	**%**
Premiums written	$ 9,843		$ 8,561		$ 7,483	
Premiums earned	$ 9,165	100.0	$ 8,111	100.0	$ 7,143	100.0
Losses and loss adjustment expenses	6,336	69.1	5,261	64.9	4,511	63.1
Underwriting expenses	2,446	26.7	2,180	26.9	1,913	26.8
Total losses and expenses	8,782	95.8	7,441	91.8	6,424	89.9
Pre-tax underwriting gain	$ 383		$ 670		$ 719	

Premiums written in 2019 increased approximately $1.3 billion (15.0%) compared to 2018. The increase was primarily attributable to volume increases from BH Specialty (30%), GUARD (28%) and MedPro Group (14%) and from the effects of the MLMIC acquisition, partially offset by the effects of the divestiture of Applied Underwriters and lower volume at BHHC. The increases in premiums earned in 2019 reflected the overall volume increase over the past year.

Management's Discussion and Analysis *(Continued)*

Insurance—Underwriting *(Continued)*

Berkshire Hathaway Primary Group (Continued)

BH Primary produced pre-tax underwriting earnings of $383 million in 2019 and $670 million in 2018. BH Primary's aggregate loss ratios were 69.1% in 2019 and 64.9% in 2018. Losses and loss adjustment expenses incurred included reductions for prior years' loss events of $499 million in 2019 and $715 million in 2018. The decrease in 2019 was primarily attributable to lower than anticipated medical professional liability and workers' compensation losses, partially offset by higher commercial auto and other liability losses. There were no losses from significant catastrophe events in 2019 that affected BH Primary. Underwriting results in 2018 included estimated losses from Hurricanes Florence and Michael and the wildfires in California of approximately $190 million.

Premiums written and earned in 2018 increased 14.4% and 13.6%, respectively, compared to 2017. The increases were primarily attributable to written premium growth at BH Specialty (33%), GUARD (19%), NICO Primary (14%) and BHHC (8%). BH Primary's loss ratios were 64.9% in 2018 and 63.1% in 2017. Losses and loss adjustment expenses included losses from significant catastrophe events of $190 million in 2018 from Hurricanes Florence and Michael and the wildfires in California and $225 million in 2017 from Hurricanes Harvey, Irma and Maria. Losses and loss adjustment expenses also included net gains from the reductions of estimated ultimate liabilities for prior years' loss events of $715 million in 2018 and $766 million in 2017. The liability reductions in each year primarily related to healthcare malpractice and workers' compensation business.

BH Primary insurers write significant levels of commercial and professional liability and workers' compensation insurance and the related claim costs may be subject to high severity and long claim-tails. Accordingly, we could experience significant increases in claims liabilities in the future attributable to higher than expected claim settlements, adverse litigation outcomes or judicial rulings and other factors not currently anticipated.

Berkshire Hathaway Reinsurance Group

We offer excess-of-loss and quota-share reinsurance coverages on property and casualty risks and life and health reinsurance to insurers and reinsurers worldwide through several subsidiaries, led by National Indemnity Company ("NICO"), Berkshire Hathaway Life Insurance Company of Nebraska ("BHLN") and General Reinsurance Corporation, General Reinsurance AG and General Re Life Corporation ("General Re"). We also periodically assume property and casualty risks under retroactive reinsurance contracts written through NICO. In addition, we write periodic payment annuity contracts predominantly through BHLN.

Generally, we strive to generate underwriting profits. However, time-value-of-money concepts are important elements in establishing prices for retroactive reinsurance and periodic payment annuity businesses due to the expected long durations of the liabilities. We expect to incur pre-tax underwriting losses from such businesses, primarily through deferred charge amortization and discount accretion charges. We receive premiums at the inception of these contracts, which are then available for investment. A summary of BHRG's premiums and pre-tax underwriting results follows (dollars in millions).

	Premiums written			Premiums earned			Pre-tax underwriting gain (loss)		
	2019	2018	2017	2019	2018	2017	2019	2018	2017
Property/casualty	$10,428	$ 9,413	$ 7,713	$ 9,911	$ 8,928	$ 7,552	$ 16	$ (207)	$(1,595)
Life/health	4,977	5,446	4,846	4,883	5,343	4,808	326	216	(52)
Retroactive reinsurance	684	517	10,755	684	517	10,755	(1,265)	(778)	(1,330)
Periodic payment annuity	863	1,156	898	863	1,156	898	(549)	(340)	(671)
	$16,952	$16,532	$24,212	$16,341	$15,944	$24,013	$(1,472)	$(1,109)	$(3,648)

Insurance—Underwriting *(Continued)*

Property/casualty

A summary of property/casualty reinsurance underwriting results follows (dollars in millions).

	2019		2018		2017	
	Amount	**%**	**Amount**	**%**	**Amount**	**%**
Premiums written	$ 10,428		$ 9,413		$ 7,713	
Premiums earned	$ 9,911	100.0	$ 8,928	100.0	$ 7,552	100.0
Losses and loss adjustment expenses	7,313	73.8	6,929	77.6	7,217	95.6
Underwriting expenses	2,582	26.0	2,206	24.7	1,930	25.5
Total losses and expenses	9,895	99.8	9,135	102.3	9,147	121.1
Pre-tax underwriting gain (loss)	$ 16		$ (207)		$ (1,595)	

Property/casualty premiums written in 2019 of $10.4 billion represented an increase of 10.8% compared to 2018. Premiums earned in 2019 increased $983 million (11.0%) versus 2018. The increase in premiums written reflected overall growth in U.S. and international markets. The growth was primarily attributable to new business, net of non-renewals, and increased participations for renewal business, partly offset by the unfavorable foreign currency translation effects of a stronger U.S. Dollar. Property/casualty premiums written in 2018 were $9.4 billion, an increase of 22.0% over 2017. The increase was primarily attributable to new business and increased participations for renewal business in both property and casualty lines. Premiums earned included $1.7 billion in 2019 and $1.8 billion in both 2018 and 2017 from a 10-year, 20% quota-share contract with Insurance Australia Group Limited, which expires in 2025.

Losses and loss adjustment expenses were $7.3 billion in 2019, $6.9 billion in 2018 and $7.2 billion in 2017 and losses and loss adjustment expense ratios were 73.8% in 2019, 77.6% in 2018 and 95.6% in 2017. Losses and loss adjustment expenses included incurred losses from significant catastrophe events occurring each year, including approximately $1.0 billion in 2019 ($700 million in the fourth quarter), $1.3 billion in 2018 ($1.1 billion in the fourth quarter) and $2.4 billion in 2017. Losses in 2019 derived from Typhoons Faxia and Hagibis and wildfires in California and Australia. Losses in 2018 derived from Hurricanes Florence and Michael, Typhoon Jebi and wildfires in California. Losses in 2017 derived from Hurricanes Harvey, Irma and Maria, an earthquake in Mexico, a cyclone in Australia and wildfires in California.

Before the effects of significant catastrophe events, losses and loss adjustment expense ratios were 64% in 2019, 63% in 2018 and 64% in 2017. Losses and loss adjustment expenses also included gains from net decreases in estimated ultimate claim liabilities attributable to prior years' loss events of approximately $295 million in 2019, $469 million in 2018 and $295 million in 2017. Such decreases as percentages of the related net unpaid claim liabilities as of the beginning of the applicable year were 1.0% in 2019, 1.7% in 2018 and 1.2% in 2017.

Life/health

A summary of our life/health reinsurance underwriting results follows (dollars in millions).

	2019		2018		2017	
	Amount	**%**	**Amount**	**%**	**Amount**	**%**
Premiums written	$ 4,977		$ 5,446		$ 4,846	
Premiums earned	$ 4,883	100.0	$ 5,343	100.0	$ 4,808	100.0
Life and health insurance benefits	3,757	76.9	4,226	79.1	4,276	88.9
Underwriting expenses	800	16.4	901	16.9	584	12.2
Total benefits and expenses	4,557	93.3	5,127	96.0	4,860	101.1
Pre-tax underwriting gain (loss)	$ 326		$ 216		$ (52)	

Insurance—Underwriting *(Continued)*

Life/health (Continued)

Life/health premiums earned were $4.9 billion in 2019, a decrease of $460 million (8.6%) compared to 2018. In the first quarter of 2019, BHLN amended a yearly-renewable-term life reinsurance contract with a major reinsurer. The amendment effectively eliminated BHLN's future exposures under the contract. BHLN recorded a reduction in earned premiums on this contract in 2019 of $49 million while premiums earned in 2018 related to this contract were $954 million. Life/health premiums earned in 2019 also included $228 million from a single reinsurance contract covering health insurance risks. We also experienced volume growth in several international life markets, partially offset by the unfavorable effects of foreign currency translation attributable to a stronger U.S. Dollar and lower U.S. life volumes.

The life/health business produced pre-tax underwriting earnings of $326 million in 2019. Underwriting results for 2019 included a one-time pre-tax gain of $163 million attributable to the yearly-renewable-term life reinsurance contract amendment. Pre-tax underwriting earnings in 2019 also included losses from increased disability benefit liabilities in Australia, attributable to higher claims experience and changes to various underlying assumptions, increased U.S. long-term care liabilities due to discount rate reductions and changes in other actuarial assumptions, and an increase in life claims in North America, partially offset by increased earnings from other international life business. Variable annuity guarantee reinsurance contracts produced pre-tax earnings of $167 million in 2019. Underwriting results from this business reflect changes in estimated liabilities for guaranteed benefits, which derive from changes in securities markets and interest rates and from the periodic amortization of expected profit margins.

Life/health premiums earned in 2018 were $5.3 billion, an increase of $535 million (11.1%) over 2017. The increase was primarily attributable to growth in the North America, Asia and Australia life insurance markets. Our life/health business produced pre-tax underwriting earnings of $216 million in 2018 and losses of $52 million in 2017. The underwriting earnings in 2018 reflected lower losses from the run-off of U.S. long-term care business, partially offset by lower earnings from the run-off of variable annuity guarantee contracts. In the fourth quarter of 2017, we recorded pre-tax losses of $450 million from discount rate reductions and changes in other actuarial assumptions associated with long-term care liabilities. Pre-tax earnings from variable annuity guarantee contracts were $34 million in 2018 and $256 million in 2017.

Retroactive reinsurance

Retroactive reinsurance premiums earned in 2019 and 2018 were $684 million and $517 million, respectively, and were attributable to a limited number of contracts in each year. Premiums earned in 2017 included $10.2 billion from an aggregate excess-of-loss retroactive reinsurance agreement with various subsidiaries of American International Group, Inc. (the "AIG Agreement"). At the inception of our retroactive reinsurance contracts, we record the estimated ultimate claim liabilities, and we also record the excess of such claim liabilities over the premiums received as a deferred charge asset. Thus, as of the inception dates of these contracts, there is no net underwriting gain or loss.

Pre-tax underwriting losses in each year derived from deferred charge amortization and changes in the estimated timing and amount of future claim payments, as well as from foreign currency gains/losses arising from the periodic remeasurement of liabilities related to contracts written by our U.S. subsidiaries that are denominated in foreign currencies. Foreign currency remeasurement produced pre-tax losses of $76 million in 2019, gains of $169 million in 2018 and losses of $264 million in 2017.

Retroactive reinsurance contracts generated pre-tax underwriting losses before foreign currency gains/losses of $1,189 million in 2019, $947 million in 2018 and $1,066 million in 2017. Losses included deferred charge amortization of $646 million in 2019, $611 million in 2018 and $527 million in 2017 related to the AIG Agreement. In 2019, we increased estimated ultimate liabilities for prior years' retroactive reinsurance contracts by $378 million compared to a decrease of $341 million in 2018. After adjustments to the related unamortized deferred charges from changes in the estimated timing and amount of the future claim payments, such changes produced pre-tax underwriting losses of approximately $125 million in 2019 and earnings of $185 million in 2018.

Gross unpaid losses assumed under retroactive reinsurance contracts were $42.4 billion at December 31, 2019 and $41.8 billion at December 31, 2018. Unamortized deferred charge assets related to such reinsurance contracts were $13.7 billion at December 31, 2019 and $14.1 billion at December 31, 2018. Deferred charge assets will be charged to earnings over the expected remaining claims settlement periods through periodic amortization.

Insurance—Underwriting *(Continued)*

Periodic payment annuity

Periodic payment annuity premiums earned in 2019 were $863 million, a decrease of $293 million (25.3%) compared to 2018, while premiums earned in 2018 increased $258 million (28.7%) compared to 2017. Periodic payment annuity business is price sensitive. The volumes written can change rapidly due to changes in prices, which are affected by prevailing interest rates, the perceived risks and durations associated with the expected annuity payments as well as the level of competition.

Periodic payment annuity contracts normally produce pre-tax underwriting losses deriving from the recurring discount accretion of annuity liabilities. Underwriting results also include the effects of mortality and interest rate changes and remeasurement gains and losses related to foreign currency denominated liabilities of certain contracts written by our U.S. subsidiaries. Foreign currency remeasurement losses were $40 million in 2019 compared to gains of $93 million in 2018 and losses of $190 million in 2017.

Excluding foreign currency remeasurement gains and losses, pre-tax underwriting losses from periodic payment annuity contracts were $509 million in 2019 compared to $433 million in 2018 and $481 million in 2017. These losses primarily derived from the recurring discount accretion of annuity liabilities, as well as the impact of mortality and interest rate changes. Discounted annuity liabilities were $13.5 billion at December 31, 2019 and $12.5 billion at December 31, 2018 and at December 31, 2019, the weighted average discount rate was approximately 4.1%.

Insurance—Investment Income

A summary of net investment income attributable to our insurance operations follows (dollars in millions).

	2019	2018	2017
Interest and other investment income	$ 2,075	$ 1,851	$ 1,263
Dividend income	4,525	3,652	3,592
Investment income before income taxes and noncontrolling interests	6,600	5,503	4,855
Income taxes and noncontrolling interests	1,070	949	968
Net investment income	$ 5,530	$ 4,554	$ 3,887
Effective income tax rate	16.1%	17.2%	19.9%

Interest and other investment income in 2019 increased $224 million (12.1%) compared to 2018. The increase was primarily due to higher interest rates on short-term investments and interest from a term loan with Seritage Growth Properties, partially offset by lower income earned from fixed maturity securities and limited partnership investments. Dividend income in 2019 increased $873 million (23.9%) compared to 2018. The increase in dividend income was attributable to an overall increase in investment levels over the past year, including the investment in $10 billion liquidation value of 8% Cumulative Preferred Stock of Occidental Petroleum Corporation on August 8, 2019, and higher dividend rates on common stock investments. We continue to hold large balances of cash, cash equivalents and short-term U.S. Treasury Bills. While short-term interest yields in the U.S. were higher in the first half of 2019 compared to 2018, interest rates declined during the second half of the year. Accordingly, earnings from such balances will likely be lower in 2020 than in 2019. We believe that maintaining ample liquidity is paramount and we insist on safety over yield with respect to short-term investments.

Pre-tax interest and other investment income in 2018 increased $588 million (46.6%) compared to 2017. The increase reflected the effect of higher short-term interest rates in 2018 and higher other investment income, partly offset by lower interest income as a result of lower average investments in fixed maturity securities. Dividend income increased $60 million (1.7%) in 2018 as compared to 2017, reflecting the impact of increased investments in marketable equity securities and higher dividend rates on common stock holdings, partially offset by Restaurant Brands International's redemption of our $3 billion investment in 9% preferred stock in December 2017.

Invested assets of our insurance businesses derive from shareholder capital, including reinvested earnings, and from net liabilities under insurance and reinsurance contracts or "float." The major components of float are unpaid losses and loss adjustment expenses, including liabilities under retroactive reinsurance contracts, life, annuity and health insurance benefit liabilities, unearned premiums and other liabilities due to policyholders, less insurance premiums and reinsurance receivables, deferred charges assumed under retroactive reinsurance contracts and deferred policy acquisition costs. Float approximated $129 billion at December 31, 2019, $123 billion at December 31, 2018 and $114 billion at December 31, 2017. Our combined insurance operations generated pre-tax underwriting earnings of approximately $417 million in 2019 and $2.0 billion in 2018, and consequently, the average cost of float for each of those periods was negative. Pre-tax underwriting losses were approximately $3.2 billion in 2017 and our average cost of float in 2017 was approximately 3.0%.

Insurance—Investment Income *(Continued)*

A summary of cash and investments held in our insurance businesses as of December 31, 2019 and 2018 follows (in millions).

	December 31, 2019	December 31, 2018
Cash, cash equivalents and U.S. Treasury Bills	$ 64,908	$ 64,548
Equity securities	240,126	166,385
Fixed maturity securities	18,537	19,690
Other	2,481	2,288
	$ 326,052	$ 252,911

Fixed maturity investments as of December 31, 2019 were as follows (in millions).

	Amortized cost	Unrealized gains/losses	Carrying value
U.S. Treasury, U.S. government corporations and agencies	$ 3,047	$ 35	$ 3,082
Foreign governments	8,582	54	8,636
Corporate bonds, investment grade	5,408	441	5,849
Corporate bonds, non-investment grade	396	14	410
Other	492	68	560
	$ 17,925	$ 612	$ 18,537

U.S. government obligations are rated AA+ or Aaa by the major rating agencies. Approximately 87% of all foreign government obligations were rated AA or higher. Non-investment grade corporate securities represent securities rated below BBB- or Baa3. Foreign government securities include obligations issued or unconditionally guaranteed by national or provincial government entities.

Railroad ("Burlington Northern Santa Fe")

Burlington Northern Santa Fe, LLC ("BNSF") operates one of the largest railroad systems in North America, with approximately 32,500 route miles of track in 28 states. BNSF also operates in three Canadian provinces. BNSF classifies its major business groups by type of product shipped. These business groups include consumer products, coal, industrial products and agricultural products. A summary of BNSF's earnings follows (dollars in millions).

	2019	2018	2017
Revenues	$ 23,515	$ 23,855	$ 21,387
Operating expenses:			
Compensation and benefits	5,347	5,394	5,023
Fuel	2,944	3,346	2,518
Purchased services	2,700	2,870	2,514
Depreciation and amortization	2,403	2,317	2,352
Equipment rents, materials and other	1,801	2,024	1,636
Total operating expenses	15,195	15,951	14,043
Interest expense	1,070	1,041	1,016
	16,265	16,992	15,059
Pre-tax earnings	7,250	6,863	6,328
Income taxes	1,769	1,644	2,369
Net earnings	$ 5,481	$ 5,219	$ 3,959
Effective income tax rate	24.4%	24.0%	37.4%

2019 versus 2018

BNSF's revenues were $23.5 billion in 2019, a decrease of $340 million (1.4%) versus 2018. During 2019, BNSF's revenues reflected a 3.6% comparative increase in average revenue per car/unit and a 4.5% decrease in volume. Volume was 10.2 million cars/units compared to 10.7 million in 2018. The increase in average revenue per car/unit was attributable to increased rates per car/unit and a favorable outcome of an arbitration hearing. Pre-tax earnings in 2019 were approximately $7.3 billion, an increase of 5.6% over 2018. BNSF experienced severe winter weather and flooding on parts of the network, which negatively affected revenues, expenses and service levels. In addition to the impact of an increase in average revenue per car/unit, BNSF's earnings in 2019 benefitted from a reduction in total operating expenses.

Railroad ("Burlington Northern Santa Fe") *(Continued)*

Revenues from consumer products were $7.9 billion in 2019, a decrease of 0.5% compared to 2018, reflecting higher average revenue per car/unit and volume decreases of 4.6%. The volume decreases were driven by moderated demand and the availability of truck capacity, as well as lower west coast imports.

Revenues from industrial products were $6.1 billion in 2019, an increase of 1.7% from 2018. The increase was attributable to higher average revenue per car/unit, partially offset by a volume decrease of 3.0%. Volumes decreased primarily due to overall softness in the industrial sector, lower sand volumes, and reduced car loadings due to the challenging weather conditions in 2019. Strength in the energy sector, which drove higher demand for petroleum products and liquefied petroleum gas, partially offset the decreases in volumes.

Revenues from agricultural products decreased 0.3% in 2019 to $4.7 billion compared to 2018. The decrease was due to lower volumes of 5.1% and higher average revenue per car/unit. The volume decreases were attributable to export competition from non-U.S. sources, the impacts of international trade policies, and the challenging weather conditions in 2019.

Revenues from coal decreased 7.4% in 2019 to $3.7 billion compared to 2018. This decrease reflected lower average revenue per car/unit and lower volumes of 5.3%. Volumes were negatively impacted by adverse weather conditions, as well as from the effects of lower natural gas prices.

Operating expenses were $15.2 billion in 2019, a decrease of $756 million (4.7%) compared to 2018. Our ratio of operating expenses to revenues decreased 2.3 percentage points to 64.6% in 2019 versus 2018. BNSF's expenses in 2019 reflected lower volume-related costs, lower fuel prices, the effects of cost control initiatives, and a retirement plan curtailment gain, partially offset by the costs associated with the adverse weather conditions.

Fuel expenses decreased $402 million (12.0%) compared to 2018, primarily due to lower average fuel prices, lower volumes, and improved fuel efficiency. Purchased services expense decreased $170 million (5.9%) compared to 2018. The decrease was due to lower purchased transportation costs of our logistics services business, lower drayage, lower services expense, and higher insurance recoveries. Equipment rents, materials and other expense decreased $223 million (11.0%) compared to 2018. The decrease was primarily due to a $120 million curtailment gain from the amendment to the company-sponsored defined benefit retirement plans, as well as from lower locomotive and various other costs associated with lower volumes and cost controls.

BNSF's effective income tax rate was 24.4% in 2019, 24.0% in 2018 and 37.4% in 2017. The rate in 2017 excluded the effects of the TCJA, which reduced the U.S. statutory income tax rate.

2018 versus 2017

BNSF's revenues were $23.9 billion in 2018, an increase of $2.5 billion (11.5%) over 2017. BNSF's revenues in 2018 reflected a 6.2% comparative increase in average revenue per car/unit and a 4.1% increase in volume. Combined volume was 10.7 million cars/units compared to 10.3 million in 2017. The increase in average revenue per car/unit was attributable to increased rates per car/unit, higher fuel surcharge revenue driven by higher fuel prices, and business mix changes. Pre-tax earnings were approximately $6.9 billion in 2018, an increase of 8.5% compared to 2017.

Revenues from consumer products were $7.9 billion in 2018, an increase of 11.1% compared to 2017, reflecting higher average revenue per car/unit and volume increases of 2.9%. The volume increases were due to higher domestic intermodal volumes, as well as growth in imports and containerized agricultural product exports, partially offset by a sizable contract loss.

Revenues from industrial products were $6.0 billion in 2018, an increase of 16.2% from 2017. The increase was attributable to volume increases of 9.8% as well as higher average revenue per car/unit. Volumes in 2018 increased for petroleum products, building products, construction products, and plastics.

Revenues from agricultural products increased 8.8% in 2018 to $4.7 billion compared to 2017. The increase was due to higher volumes of 9.0%, partially offset by slightly lower average revenue per car/unit. Volumes increased due to strong export and domestic corn shipments, as well as higher fertilizer and other grain products volumes, partially offset by a reduction in soybean and wheat exports.

Revenues from coal in 2018 increased 4.3% to $4.0 billion compared to 2017, attributable to higher average revenue per car/unit, partially offset by lower volumes of 0.8%. The volume decrease in 2018 was due mainly to utility plant retirements combined with competition from natural gas and renewables, mostly offset by market share gains and increased export volumes.

Railroad ("Burlington Northern Santa Fe") *(Continued)*

Total operating expenses were $16.0 billion in 2018, an increase of $1.9 billion (13.6%) compared to 2017. Our ratio of operating expenses to revenues increased 1.2 percentage points to 66.9% in 2018 versus 2017. Compensation and benefits expenses increased $371 million (7.4%) compared to 2017. The increase was primarily due to wage inflation and increased headcount and associated training costs. Fuel expenses increased $828 million (32.9%) compared to 2017 primarily due to higher average fuel prices and increased volumes. Purchased services expense increased $356 million (14.2%) compared to 2017, due to higher purchased transportation costs of our logistics services business, as well as increased intermodal ramping, drayage, and other volume-related costs. Equipment rents, materials and other expense increased $388 million (23.7%) compared to 2017, reflecting higher locomotive material expenses, personal injury expenses, derailment-related costs, and property taxes, as well as the impact of a benefit in 2017 from the enactment of the TCJA on an equity method investee.

Utilities and Energy ("Berkshire Hathaway Energy Company")

We currently own 90.9% of the outstanding common stock of Berkshire Hathaway Energy Company ("BHE"), which operates a global energy business. BHE's domestic regulated utility interests are comprised of PacifiCorp, MidAmerican Energy Company ("MEC") and NV Energy. In Great Britain, BHE subsidiaries operate two regulated electricity distribution businesses referred to as Northern Powergrid. BHE also owns two domestic regulated interstate natural gas pipeline companies. Other energy businesses include a regulated electricity transmission-only business in Alberta, Canada ("AltaLink, L.P.") and a diversified portfolio of mostly renewable independent power projects. BHE also operates the largest residential real estate brokerage firm and one of the largest residential real estate brokerage franchise networks in the United States.

The rates our regulated businesses charge customers for energy and services are based in large part on the costs of business operations, including income taxes and a return on capital, and are subject to regulatory approval. To the extent these regulated operations are not allowed to include such costs in the approved rates, operating results will be adversely affected. The TCJA reduced the U.S. federal statutory income tax rate from 35% to 21%. In 2018, BHE's regulated subsidiaries began passing the benefits of lower income tax expense attributable to the TCJA to customers through various regulatory mechanisms, including lower rates, higher depreciation and reductions to rate base. A summary of BHE's net earnings follows (dollars in millions).

	2019	2018	2017
Revenues:			
Energy operating revenue	$ 15,371	$ 15,573	$ 15,171
Real estate operating revenue	4,473	4,214	3,443
Other income	270	200	240
Total revenue	20,114	19,987	18,854
Costs and expense:			
Energy cost of sales	4,586	4,769	4,518
Energy operating expense	6,824	6,969	6,354
Real estate operating costs and expense	4,251	4,000	3,229
Interest expense	1,835	1,777	2,254
Total costs and expense	17,496	17,515	16,355
Pre-tax earnings	2,618	2,472	2,499
Income tax expense (benefit)*	(526)	(452)	148
Net earnings after income taxes	3,144	2,924	2,351
Noncontrolling interests	18	23	40
Net earnings attributable to Berkshire Hathaway Energy	3,126	2,901	2,311
Noncontrolling interests	286	280	278
Net earnings attributable to Berkshire Hathaway shareholders	$ 2,840	$ 2,621	$ 2,033
Effective income tax rate	(20.1)%	(18.3)%	5.9%

* *Includes significant production tax credits from wind-powered electricity generation.*

Utilities and Energy ("Berkshire Hathaway Energy Company") *(Continued)*

The discussion of BHE's operating results that follows is based on after-tax earnings, reflecting how the energy businesses are managed and evaluated. A summary of net earnings attributable to BHE follows (in millions).

	2019	2018	2017
PacifiCorp	$ 773	$ 739	$ 763
MidAmerican Energy Company	781	669	597
NV Energy	365	317	365
Northern Powergrid	256	239	251
Natural gas pipelines	422	387	270
Other energy businesses	608	489	404
Real estate brokerage	160	145	118
Corporate interest and other	(239)	(84)	(457)
	$ 3,126	$ 2,901	$ 2,311

PacifiCorp

PacifiCorp operates a regulated electric utility in portions of several Western states, including Utah, Oregon and Wyoming. Net earnings after income taxes were $773 million in 2019, an increase of $34 million (4.6%) compared to 2018, reflecting slightly higher utility margin (operating revenue less cost of sales) and higher other income, partly offset by higher depreciation expense from additional plant-in-service. Utility margin was $3.3 billion in 2019, an increase of $4 million compared to 2018, as higher retail revenue from a 0.4% increase in retail customer volumes, in part due to the favorable impact of weather, was largely offset by lower wholesale revenue mainly due to lower volumes.

Net earnings after income taxes decreased $24 million (3.1%) in 2018 as compared to 2017. The change in after-tax earnings reflected the unfavorable utility margin and higher operating expenses, partly offset by higher other income. Utility margin in 2018 was $3.3 billion, a decrease of $198 million (6%) versus 2017. The decrease was primarily due to a $197 million decline in retail revenues from the effects of lower average rates of $180 million (including the impact of the TCJA of $152 million) and a reduction in volumes (0.2%), largely attributable to the impacts of weather.

MidAmerican Energy Company

MEC operates a regulated electric and natural gas utility primarily in Iowa and Illinois. Net earnings after income taxes of $781 million in 2019 increased $112 million (16.7%) as compared to 2018, primarily attributable to increases in electric utility margin, income tax benefits from higher production tax credits and the effects of ratemaking, and other income. Electric utility margin in 2019 increased 2% to $1.8 billion, primarily due to higher wind generation and higher retail customer volumes of 1.4%, as an increase in industrial volumes of 4.0% was largely offset by lower residential volumes from the unfavorable impact of weather. These earnings increases were partially offset by increased depreciation expense from additional assets placed in-service (net of lower Iowa revenue sharing) and higher net interest expense.

Net earnings after income taxes were $669 million in 2018, an increase of $72 million (12.1%) compared to 2017, reflecting higher electric utility margin, higher depreciation and operating expenses and higher income tax benefits, partly due to higher production tax credits. Electric utility margin was $1.8 billion in 2018, an increase of $122 million (7%) compared to 2017, which was primarily due to higher retail revenues of $102 million, reflecting higher recoveries through bill riders and volumes, partially offset by lower rates, predominantly from the impact of the TCJA. The increase in depreciation expense included $65 million from additional wind generation and other plant placed in-service and $44 million from Iowa revenue sharing.

NV Energy

NV Energy operates regulated electric and natural gas utilities in Nevada. Net earnings after income taxes were $365 million in 2019, an increase of $48 million (15.1%) compared to 2018, as lower operating expenses were partly offset by lower electric utility margin. Electric utility margin in 2019 was $1.6 billion, representing a decrease of $58 million (3%) versus 2018. The decrease was primarily due to a 1.4% decline in retail customer volumes, largely attributable to the impacts of weather, and rate reductions from the impact of the TCJA, partially offset by retail customer growth.

Net earnings after income taxes decreased $48 million (13.2%) in 2018 as compared to 2017, reflecting lower electric utility margin and increased depreciation and operating expenses. Electric utility margin decreased $52 million in 2018 as compared to 2017 due to the effects of the TCJA, partially offset by higher retail sales volumes.

Utilities and Energy ("Berkshire Hathaway Energy Company") *(Continued)*

Northern Powergrid

Net earnings after income taxes increased 7.1% in 2019 compared to 2018, reflecting higher distribution revenues and lower operating expenses, which were largely from lower pension settlement losses in 2019, partially offset by the unfavorable foreign currency translation effects of a strong average U.S. Dollar ($10 million). Distribution revenues increased $18 million, attributable to higher tariff rates, partly offset by lower distributed units.

Net earnings after income taxes were $239 million in 2018, a decrease of $12 million (4.8%) compared to 2017, reflecting higher distribution revenues, increased depreciation and operating expenses, including higher pension settlement losses, and a $9 million increase from the effects of a weaker U.S. Dollar.

Natural gas pipelines

Net earnings after income taxes increased $35 million (9.0%) in 2019 compared to 2018, primarily due to higher transportation revenues from generally higher volumes and rates, favorable margins from system balancing activities and a decrease in operating expenses, partly offset by higher depreciation expense due to increased spending on capital projects.

Net earnings after income taxes were $387 million in 2018, a 43.3% increase ($117 million) compared to 2017, reflecting higher transportation revenues from higher volumes and rates due to unique market opportunities and colder average temperatures, lower depreciation expense and a comparative increase in operating expenses.

Other energy businesses

Net earnings after income taxes in 2019 were $608 million, an increase of $119 million (24.3%) compared to 2018. The increase was primarily due to improved earnings from renewable wind energy projects ($49 million from tax equity investments and $25 million from new and existing projects and activities), higher after-tax income from geothermal and natural gas units of $53 million, largely due to higher generation and favorable margins and lower operating expenses, partly offset by lower earnings at a hydroelectric facility in the Philippines due to lower rainfall. The increase in earnings also reflected the effects of favorable regulatory decisions received in 2019 and the unfavorable impacts of a regulatory rate order received in 2018 at AltaLink L.P.

Net earnings after income taxes increased $85 million (21.0%) in 2018 compared to 2017, reflecting increased revenues from existing renewable energy projects from overall higher generation and pricing, increased earnings from wind tax equity investments of $34 million and earnings from additional wind and solar capacity placed in-service, partially offset by higher operating expenses at existing projects.

Real estate brokerage

Net earnings after income taxes increased 10.3% in 2019 compared to 2018. The increase was primarily due to higher after-tax earnings at existing mortgage businesses due to increased refinance activity and earnings attributable to recent business acquisitions, partially offset by lower after-tax earnings at existing brokerage businesses, primarily from lower units and margins.

Net earnings after income taxes were $145 million in 2018, an increase of $27 million (22.9%) compared to 2017. The increase reflected earnings from acquired businesses, higher comparative operating expenses and lower margins at existing businesses and lower income tax expense due to the impact of the TCJA.

Corporate interest and other

Net earnings after income taxes decreased $155 million in 2019 compared to 2018, primarily due to income tax benefits recognized in 2018 related to the reduction of accrued repatriation taxes on undistributed foreign earnings in connection with the TCJA, higher corporate interest and lower after-tax earnings from non-regulated energy services.

Net earnings after income taxes increased $373 million in 2018 compared to 2017, primarily due to an after-tax charge of $246 million recognized in 2017 from a tender offer completed in December 2017 to redeem certain long-term debt of BHE and the TCJA income tax benefits recognized in 2018.

Manufacturing, Service and Retailing

A summary of revenues and earnings of our manufacturing, service and retailing businesses follows (dollars in millions).

	Revenues			Earnings *		
	2019	2018	2017	2019	2018	2017
Manufacturing	$ 62,730	$ 61,883	$ 57,645	$ 9,522	$ 9,366	$ 8,324
Service and retailing	79,945	78,926	76,994	2,843	2,942	2,603
	$142,675	$140,809	$134,639			
Pre-tax earnings				12,365	12,308	10,927
Income taxes and noncontrolling interests				2,993	2,944	3,645
				$ 9,372	$ 9,364	$ 7,282
Effective income tax rate				23.7%	23.4%	32.8%

* *Excludes certain acquisition accounting expenses, which primarily related to the amortization of identified intangible assets recorded in connection with our business acquisitions. The after-tax acquisition accounting expenses excluded from earnings above were $788 million in 2019, $932 million in 2018 and $937 million in 2017. These expenses are included in "Other" in the summary of earnings on page K-32 and in the "Other" earnings section on page K-53.*

Manufacturing

Our manufacturing group includes a variety of industrial, building and consumer products businesses. Industrial products group includes specialty chemicals (The Lubrizol Corporation ("Lubrizol")), complex metal products for aerospace, power and general industrial markets (Precision Castparts Corp. ("PCC")), metal cutting tools/systems (IMC International Metalworking Companies ("IMC")), equipment and systems for the livestock and agricultural industries (CTB International ("CTB")), and a variety of industrial products for diverse markets (Marmon, Scott Fetzer and LiquidPower Specialty Products ("LSPI")). Marmon also provides various products and services (including equipment leasing) for the rail, intermodal container and mobile crane industries.

The building products group includes homebuilding and manufactured housing finance (Clayton Homes), flooring (Shaw), insulation, roofing and engineered products (Johns Manville), bricks and masonry products (Acme Building Brands), paint and coatings (Benjamin Moore), and residential and commercial construction and engineering products and systems (MiTek). The consumer products group includes leisure vehicles (Forest River), several apparel and footwear operations (including Fruit of the Loom, Garan, H.H. Brown Shoe Group and Brooks Sports) and a manufacturer of high-performance alkaline batteries (Duracell). This group also includes custom picture framing products (Larson Juhl) and jewelry products (Richline). A summary of revenues and pre-tax earnings of our manufacturing operations follows (dollars in millions).

	Revenues			Pre-tax earnings		
	2019	2018	2017	2019	2018	2017
Industrial products	$ 30,594	$ 30,679	$ 28,566	$ 5,635	$ 5,822	$ 5,065
Building products	20,327	18,677	16,946	2,636	2,336	2,147
Consumer products	11,809	12,527	12,133	1,251	1,208	1,112
	$ 62,730	$ 61,883	$ 57,645	$ 9,522	$ 9,366	$ 8,324

Manufacturing, Service and Retailing *(Continued)*

Industrial products

2019 versus 2018

Revenues of the industrial products group were $30.6 billion in 2019, a slight decrease from 2018. Pre-tax earnings of the group were $5.6 billion in 2019 compared to $5.8 billion in 2018. Pre-tax earnings as a percentage of revenues for the group were 18.4% in 2019 compared to 19.0% in 2018.

PCC's revenues were $10.3 billion in 2019, an increase of $74 million (0.7%) compared to 2018. PCC experienced increased sales in aerospace markets, which was partially offset by lower sales in the power markets compared to 2018. The increase in aerospace sales was tempered due to significant efforts focused on the ramp-up requirements for certain new aerospace programs, such as LEAP, that created manufacturing inefficiencies and slowed production cycles contributing to delays in product deliveries and sales. While we expect that Boeing's decision to suspend production of its 737 MAX aircraft may reduce demand for certain of our aerospace products in 2020, we also anticipate a significant portion of this volume reduction will be offset by incremental volume for other programs. We are also seeing stabilization in demand for our industrial gas turbine products within the power markets after two years of declines.

PCC's pre-tax earnings increased 5.1% in 2019 compared to 2018. The earnings increase reflected increased sales of aerospace products and higher earnings from various non-recurring items in 2019, which was partially offset by lower earnings from the power markets due to the decrease in sales. Temporary unplanned shutdowns of certain metals facilities and metal press outages also negatively impacted earnings in 2018. PCC continues to incur incremental costs to meet required deliveries to customers associated with the increased aerospace demand, which negatively affected margins and earnings. The production headwinds experienced were primarily attributable to shortages of qualified skilled labor and the rapid increase in requirements for newer, complex aerospace products. PCC implemented certain measures and intends to implement additional measures to address these issues and improve manufacturing efficiencies.

Lubrizol's revenues were $6.5 billion in 2019, a decrease of $354 million (5.2%) compared to 2018. The decline reflected lower volumes and unfavorable foreign currency translation effects, partly offset by higher average selling prices which were necessitated by raw material cost increases in 2018 and the first quarter of 2019. A fire at Lubrizol's Rouen, France manufacturing, blending and storage facility on September 26, 2019 resulted in the suspension of operations, which contributed significantly to the decline in Additives volumes. Those operations partially restarted in December 2019. Lubrizol's consolidated volume in 2019 declined 4% from 2018, primarily due to volume decline of 6% in the Additives product lines.

Lubrizol's pre-tax earnings in 2019 for the fourth quarter and year decreased 50.5% and 14.6%, respectively, compared to the same periods in 2018. Earnings in 2019 were significantly impacted by costs and lost business associated with the Rouen fire. Lubrizol's operating results in 2019 were also negatively affected by lower sales volumes, higher manufacturing expenses and unfavorable foreign currency translation effects, partly offset by improved material margins.

Marmon's revenues were $8.3 billion in 2019, an increase of $146 million (1.8%) compared to 2018. The revenue increase reflected the effects of business acquisitions over the past year, higher volumes in several business sectors, which were largely offset by lower distribution volumes in the Metals Services sector, unfavorable foreign currency translation, and the impact of lower metal prices in the Electrical and Plumbing & Refrigeration sectors. Marmon's business acquisitions included the acquisition of the Colson Medical companies on October 31, 2019, resulting in a new Medical sector. Marmon's Rail & Leasing and Crane Services sectors benefitted from higher railcar equipment sales, railcar fleet utilization, railcar repair services, intermodal container leasing revenue and improved crane rental demand in the U.S. and Australia.

Marmon's pre-tax earnings in 2019 increased $12 million (1.0%) as compared to 2018. The earnings increase reflected the effects of business acquisitions, partly offset by lower gains from business divestitures. Earnings in 2019 also reflected increased earnings in several sectors that experienced sales volume increases, which were substantially offset by lower earnings in the Metal Services and certain other sectors, the unfavorable impacts of foreign currency translation and increased interest and other expenses.

IMC's revenues in 2019 declined 1.3% in 2019 as compared to 2018, reflecting unfavorable foreign currency translation effects of a stronger U.S. Dollar and lower sales in several regions, including Asia and Europe, mostly offset by increased revenues from recent business acquisitions. IMC's pre-tax earnings declined 12.8% in 2019 versus 2018, attributable to unfavorable foreign currency translation effects, changes in business mix to lower margin items and the effects of the U.S./China trade disputes.

Manufacturing, Service and Retailing *(Continued)*

Industrial products (Continued)

CTB's revenues decreased 1.5% in 2019 versus 2018. The comparative decline was primarily due to unfavorable foreign currency translation effects of a stronger U.S. Dollar and lower revenues from grain and protein equipment, partly offset by higher revenues from processing systems. CTB's pre-tax earnings increased 11.7% in 2019 as compared to 2018. Earnings in 2019 benefitted from a combination of favorable changes in business mix, the moderation of cost increases of certain raw materials and better pricing efficiency.

2018 versus 2017

Revenues from industrial products businesses were approximately $30.7 billion in 2018, an increase of approximately $2.1 billion (7.4%) compared to 2017. Pre-tax earnings of the industrial products group were approximately $5.8 billion in 2018, an increase of $757 million (14.9%) compared to 2017. Pre-tax earnings as a percentage of revenues were 19.0% in 2018 and 17.7% in 2017. The comparative earnings increase was partially attributable to certain one-time charges at PCC and Lubrizol in 2017.

PCC's revenues in 2018 were $10.2 billion, an increase of 7.2% compared to 2017, which reflected increased demand in aerospace markets in connection with new aircraft programs, partly offset by lower demand for industrial gas turbine products. In addition, PCC experienced lower sales of certain pipe products in 2018, primarily attributable to the U.S tariffs.

PCC's pre-tax earnings increased 16.0% in 2018 compared to 2017. PCC's earnings in 2017 included certain one-time inventory and impairment charges of $272 million. Results in 2018 were negatively affected by costs associated with the temporary unplanned shut-down of certain metals facilities, metal press outages and lower earnings from the industrial gas turbine business. The facilities that were shut-down gradually resumed production and were approximately 80% operational at the end of 2018. In addition, the new aircraft programs involve relatively complex manufacturing processes, negatively affecting earnings.

Lubrizol's revenues in 2018 were $6.8 billion, an increase of 5.9% compared to 2017 due to higher average sales prices, favorable changes in product mix and foreign currency translation effects, and a 2% increase in aggregate unit volumes. Lubrizol experienced significant increases in average material unit costs during 2018 and 2017, necessitating increases in sales prices. Lubrizol's consolidated volume included increases in the Advanced Materials (5%) and the Additives (1%) product lines.

Lubrizol's pre-tax earnings in 2018 increased 43.5% compared to 2017, which included pre-tax losses of approximately $190 million related to Lubrizol's disposition of an underperforming bolt-on business and related intangible asset impairments and restructuring charges. Before such charges, Lubrizol's earnings increased 17%, reflecting the previously mentioned increases in sales volumes and selling prices, as well as lower other restructuring charges, lower net interest expense, and the favorable effects of foreign currency translation and ongoing expense control efforts, partly offset by higher raw material costs.

Marmon's revenues in 2018 were $8.2 billion, an increase of 5.5% as compared to 2017. The revenue increase was primarily attributable to volume increases in the Transportation Products sector, higher average metals prices, and the effects of business acquisitions. These increases were partially offset by revenue decreases in the Beverage Technologies and Rail Products and Services sectors. Rail Products and Services sector revenues also decreased due to lower railcar lease revenues, partly offset by increased railcar equipment sales and repair services. Throughout 2018, the railcar leasing business experienced the negative effects of lower lease renewal rates for railcars versus the rates on expiring leases.

Marmon's pre-tax earnings in 2018 decreased 5.6% compared to 2017. The decrease was primarily due to lower pre-tax earnings from the Rail Products and Services sector ($126 million) and the Foodservice Technologies and Retail Solutions sectors ($33 million), partially offset by increased earnings from the Transportation Products sector and a gain in 2018 from the sale of certain assets of the Beverage Technologies sector of $44 million. The Rail Products and Services earnings decline was attributable to lower railcar leasing revenues and higher lease fleet repair costs.

IMC's revenues increased 16.1% in 2018 compared to 2017, due to a combination of factors, including higher unit sales, the effects of business acquisitions, and foreign currency translation effects from a weaker average U.S. Dollar in the first half of 2018. IMC's pre-tax earnings increased significantly in 2018 compared to 2017, reflecting a combination of higher sales, increased manufacturing efficiencies, the effects of business acquisitions and ongoing expense control efforts, partly offset by higher raw material costs.

CTB's revenues increased 4.0% in 2018 versus 2017, due to favorable foreign currency translation effects and modest sales growth in protein production and processing systems. CTB's pre-tax earnings in 2018 were lower than 2017, primarily due to lower gross sales margins attributable to raw material cost increases and higher other operating expenses.

Manufacturing, Service and Retailing *(Continued)*

Building products

2019 versus 2018

Revenues of the building products group were $20.3 billion in 2019, an increase of $1.65 billion (8.8%) compared to 2018. Pre-tax earnings of the group were $2.6 billion in 2019, an increase of 12.8% over 2018. Pre-tax earnings as percentages of revenues were 13.0% and 12.5% in 2019 and 2018, respectively.

Clayton Homes' revenues were approximately $7.3 billion in 2019, an increase of $1.3 billion (21.5%) over 2018. The comparative increase was primarily due to increases in home sales of $1.16 billion (26%), reflecting a net increase in units sold and changes in sales mix. Unit sales of site-built homes increased 84% in 2019 over 2018, primarily due to business acquisitions, while average prices declined 5%. Manufactured home unit sales increased 5% and wholesale sales were 9% lower in 2019. Interest income from lending activities in 2019 increased 6.7% compared to 2018, attributable to increased originations and average outstanding loan balances. Aggregate loan balances outstanding were approximately $15.9 billion at December 31, 2019 compared to $14.7 billion as of December 31, 2018.

Pre-tax earnings of Clayton Homes were $1.1 billion in 2019, an increase of $182 million (20.0%) compared to 2018. The earnings increase in 2019 was attributable to home building activities, which reflected the increases in home sales, and manufactured housing lending activities. Pre-tax earnings from lending and finance activities in 2019 increased 12%, primarily due to an increase in interest income attributable to higher average loan balances, increased other financial services earnings and lower credit losses, partially offset by higher interest expense, attributable to higher average borrowings and interest rates, and by higher other operating costs.

Aggregate revenues of our other building products businesses were $13.0 billion in 2019, an increase of 2.8% versus 2018. Revenues increased for paint and coatings, hard surface flooring and roofing products, attributable to a combination of increased volumes, product mix changes and increased average selling prices, while sales of brick products declined, primarily attributable to lower volumes.

Pre-tax earnings of the other building products businesses were $1.5 billion in 2019, an increase of 8.2% over 2018. Earnings in 2019 benefitted from a combination of increases in selling prices in certain product categories, declining raw material costs for certain commodities and operating cost control initiatives, which were partly offset by the effects of increased facilities closure costs.

2018 versus 2017

Revenues of the building products group in 2018 were approximately $18.7 billion, an increase of 10.2% compared to 2017. Pre-tax earnings of the building products group were approximately $2.3 billion in 2018, an increase of 8.8% versus 2017. Overall, pre-tax earnings as a percentage of revenues were 12.5% in 2018 and 12.7% in 2017.

Clayton Homes' revenues were $6.0 billion in 2018, an increase of 20.7% over 2017. The increase was driven by an increase in revenues from home sales of $971 million (28.2%), primarily due to a 105% increase in unit sales of site-built homes attributable to businesses acquired over the last two years. Unit sales of manufactured homes in 2018 also increased 4.9% compared to 2017. Average unit prices of site-built homes are considerably higher than traditional manufactured homes. In addition, interest income from lending activities increased 4% in 2018 compared to 2017, primarily due to increased average outstanding loan balances.

Clayton Homes' pre-tax earnings were $911 million in 2018, an increase of $145 million (19.0%) compared to 2017. The increase was primarily attributable to a significant increase in earnings from home building (manufactured housing and site-built homes) activities, which reflected the impact of increased home sales and margins. Pre-tax earnings from lending activities in 2018 declined 2% compared to 2017, as increased interest expense, attributable to higher average debt balances and interest rates, and higher operating costs more than offset the increase in interest income. At December 31, 2018 and 2017, aggregate loan balances outstanding were approximately $14.7 billion and $13.7 billion, respectively.

Revenues of our other building products businesses increased 5.8% in 2018 to approximately $12.6 billion compared to 2017. In 2018, Shaw's sales increased 7.9% and Johns Manville's sales increased 7.2% as compared to 2017. The increases reflected higher average selling prices, product mix changes and overall unit volume increases.

Manufacturing, Service and Retailing *(Continued)*

Building products (Continued)

Raw material and production costs in 2018 of our building products businesses were generally higher than in 2017. For instance, steel, titanium dioxide and petrochemicals costs were substantially higher in 2018 than in 2017, as were product delivery costs, due in part to the shortage of truck drivers in the U.S. These cost increases precipitated sales price increases, although such increases lagged the increases in raw materials costs.

Consumer products

2019 versus 2018

Consumer products revenues were $11.8 billion in 2019, a decrease of $718 million (5.7%) versus 2018. Revenues of Forest River declined 12.9% versus 2018, primarily due to lower unit sales. Revenues of Duracell increased 1.3% and apparel and footwear revenues declined 1.1% compared to 2018. Despite a comparative revenue increase of 3.5% in 2019, Brooks Sports operating results were negatively affected by lost sales associated with problems encountered at a distribution center that opened in the second quarter. In addition, our other apparel and other footwear businesses continue to experience lower sales volumes for certain products, reflecting the shift by major retailers towards private label products.

Consumer products pre-tax earnings were $1.25 billion in 2019, an increase of 3.6% compared to 2018. Pre-tax earnings as a percentage of revenues were 10.6% in 2019 and 9.6% in 2018. The increase in pre-tax earnings was primarily attributable to continuing cost containment efforts across several of the businesses and the effects of a new Duracell product launch, partially offset by the impact of lower recreational vehicle sales at Forest River.

2018 versus 2017

Consumer products revenues were approximately $12.5 billion in 2018, an increase of 3.2% compared to 2017, which was primarily due to revenue increases at Forest River and at our apparel and footwear businesses. Forest River's revenues increased 2.6% in 2018, reflecting relatively unchanged unit sales versus 2017. However, over the second half of the year, comparative sales at Forest River declined 5%, reflecting a 7% decline in units sold. Apparel and footwear revenues increased 4.6% to approximately $4.3 billion, primarily due to increased sales volume at Brooks Sports and Garan.

Pre-tax earnings were $1.2 billion in 2018, an increase of 8.6% compared to 2017. Pre-tax earnings as a percentage of revenues were 9.6% in 2018 and 9.2% in 2017. The increase in earnings reflected increases from Duracell and the apparel and footwear businesses, partly offset by lower earnings from Forest River and Larson Juhl.

Forest River's pre-tax earnings declined 9.0% compared to 2017. Operating results were adversely affected over the second half of 2018, and in the fourth quarter in particular, by higher material costs, which, together with the effects of lower sales volumes, contributed to a 28% reduction in fourth quarter pre-tax earnings.

Pre-tax earnings of the apparel and footwear businesses increased 6.4% in 2018 compared to 2017, primarily attributable to the overall increase in revenues and sales mix changes. Duracell's pre-tax earnings increased in 2018 compared to 2017, reflecting the favorable effects of ongoing operational improvement efforts and a comparative decline in restructuring charges.

Service and retailing

A summary of revenues and pre-tax earnings of our service and retailing businesses follows (dollars in millions).

	Revenues			Pre-tax earnings		
	2019	2018	2017	2019	2018	2017
Service	$ 13,496	$ 13,333	$ 12,155	$ 1,681	$ 1,836	$ 1,519
Retailing	15,991	15,606	15,064	874	860	785
McLane Company	50,458	49,987	49,775	288	246	299
	$ 79,945	$ 78,926	$ 76,994	$ 2,843	$ 2,942	$ 2,603

Manufacturing, Service and Retailing *(Continued)*

Service

Our service business group offers fractional ownership programs for general aviation aircraft (NetJets) and high technology training products and services to operators of aircraft (FlightSafety). We also distribute electronic components (TTI) and franchise and service a network of quick service restaurants (Dairy Queen). Other service businesses include transportation equipment leasing (XTRA) and furniture leasing (CORT), electronic news distribution, multimedia and regulatory filings (Business Wire), publication of newspapers and other publications (Buffalo News and the BH Media Group) and operation of a television station in Miami, Florida (WPLG). We also offer third party logistics services that primarily serve the petroleum and chemical industries (Charter Brokerage).

2019 versus 2018

Service group revenues were $13.5 billion in 2019, an increase of 1.2% compared to 2018. Sales of TTI increased 2% in 2019 compared to the exceptionally high sales levels in 2018. Excluding the effects of acquisitions and foreign currency, TTI's sales in 2019 were relatively unchanged from 2018. TTI's sales began to slow in the fourth quarter of 2018 and continued to slow throughout 2019, attributable to softening customer demand, lower sales prices and the effects of U.S. trade tariffs.

Service group revenues in 2019 also reflected increases in aviation-related services (NetJets and to a lesser extent FlightSafety) and the leasing businesses, and decreases from the media businesses and Charter Brokerage, which divested a high revenue, low margin business in mid-2019. The increase in NetJets revenues in 2019 reflected increased lease revenue, primarily attributable to an increase in aircraft on lease and increased flight hours, partly offset by lower revenue from prepaid flight cards.

Pre-tax earnings of the service group were $1.7 billion in 2019, a decrease of $155 million (8.4%) compared to 2018. Pre-tax earnings of the group as a percentage of revenues were 12.5% in 2019 compared to 13.8% in 2018. The comparative declines in earnings in 2019 were primarily due to lower earnings from TTI and FlightSafety, partly offset by higher earnings from NetJets. TTI's earnings decline was attributable to lower gross margin, unfavorable foreign currency translation effects and higher operating expenses, partly offset by earnings from businesses acquired. FlightSafety's earnings decline was attributable to significant losses related to an existing government contract that were recorded in the fourth quarter, partly offset by lower training equipment impairment charges. Earnings from NetJets increased in 2019, primarily attributable to increased revenues and improved fleet and operating efficiencies, which improved operating margins.

2018 versus 2017

Revenues of the service group were approximately $13.3 billion in 2018, an increase of approximately 9.7% compared to 2017. TTI's revenues increased approximately 33.7% compared to 2017, reflecting industry-wide increases in demand for electronic components in many geographic markets around the world, the effects of recent business acquisitions and favorable foreign currency translation effects. While TTI's revenue increase in 2018 was significant, revenue growth began to moderate in the fourth quarter, in part attributable to the impact of U.S. trade tariffs. WPLG generated a revenue increase of 20.8% in 2018 over 2017, primarily due to increased political advertising revenue. Revenues of Charter Brokerage increased 53.3%, reflecting increased fees earned and product mix changes. Revenues of the CORT and XTRA leasing businesses increased 8.4% in 2018 compared to 2017 due to increased over-the road trailer units on lease and increased furniture rental income.

Pre-tax earnings of the service group in 2018 were approximately $1.8 billion, an increase of 20.9% compared to 2017. The comparative earnings increase was primarily due to TTI, which accounted for almost 84% of the increase. The earnings increase of TTI was primarily due to the effects of the sales volume increases. In addition, XTRA, Charter Brokerage and NetJets each generated increased earnings in 2018 compared to 2017. The increases in earnings of these businesses were partly offset by lower earnings at FlightSafety, primarily due to reduced margins from sales of flight simulators and training equipment impairment charges.

Retailing

Our retailers include Berkshire Hathaway Automotive ("BHA"). BHA includes over 80 auto dealerships that sell new and pre-owned automobiles and offer repair services and related products. BHA also operates two insurance businesses, two auto auctions and an automotive fluid maintenance products distributor. Our retailing businesses also include four home furnishings retailing businesses (Nebraska Furniture Mart, R.C. Willey, Star Furniture and Jordan's), which sell furniture, appliances, flooring and electronics.

Manufacturing, Service and Retailing *(Continued)*

Retailing (Continued)

Other retailing businesses include three jewelry retailing businesses (Borsheims, Helzberg and Ben Bridge), See's Candies (confectionary products), Pampered Chef (high quality kitchen tools), Oriental Trading Company (party supplies, school supplies and toys and novelties) and Detlev Louis Motorrad ("Louis"), a Germany-based retailer of motorcycle accessories.

2019 versus 2018

Retailing group revenues were $16.0 billion in 2019, an increase of 2.5% compared to 2018. BHA's revenues in 2019, which represented approximately 64% of our retailing revenues, increased 4.1% over 2018. BHA's revenue increase reflected an 11.5% increase in pre-owned vehicle sales, vehicle pricing increases, improvement in vehicle finance and service contract activities and vehicle repair work as compared to 2018. New vehicle sales in 2019 were relatively unchanged from 2018.

Home furnishings group revenues, which represented about 20% of the aggregate retailing group revenues, declined 1.3% in 2019 compared to 2018. Sales in 2019 were relatively unchanged or lower in each of our home furnishings operations.

Retail group pre-tax earnings were $874 million in 2019, an increase of 1.6% over 2018. BHA's pre-tax earnings increased 22.7%, primarily due to the increases in earnings from finance and service contract activities, partly offset by higher floorplan interest expense. Home furnishings group pre-tax earnings declined 14.7% versus 2018, reflecting the decline in revenues and generally higher operating expenses. Aggregate pre-tax earnings for the remainder of our retailing group declined 7.9% compared to 2018.

2018 versus 2017

Revenues of the retailing group were approximately $15.6 billion in 2018, an increase of 3.6% compared to 2017. BHA's revenues, which represented approximately 63% of the aggregate retailing revenues, increased 4.0% as compared to 2017. The increase derived primarily from increased pre-owned vehicle sales and service contract revenues. Revenues from new vehicle sales were relatively unchanged. Louis revenues increased 7.8% in 2018 versus 2017, primarily due to the translation effects of a weaker average U.S. Dollar. Home furnishings revenues increased 4.7% in 2018 over 2017, reflecting increased sales in certain geographic markets and the effect of a new store.

Pre-tax earnings of the retailing group were $860 million in 2018, an increase of 9.6% over 2017. The earnings increase included higher earnings from BHA and Louis, partly offset by lower earnings from the home furnishings retailers. The earnings increase of BHA was primarily from finance and service contract activities, partly offset by higher floorplan interest expense. The earnings increase at Louis reflected the revenue increase and an increase in its operating margin rate. Earnings of the home furnishings businesses declined 2.4% in 2018 compared to 2017, partly due to increased inventory liquidation, delivery and occupancy costs at Star Furniture.

McLane Company

McLane operates a wholesale distribution business that provides grocery and non-food consumer products to retailers and convenience stores ("grocery") and to restaurants ("foodservice"). McLane also operates businesses that are wholesale distributors of distilled spirits, wine and beer ("beverage"). The grocery and foodservice businesses generate high sales and very low profit margins. These businesses have several significant customers, including Walmart, 7-Eleven, Yum! Brands and others. Grocery sales comprised approximately 66% of McLane's consolidated sales in 2019 with food service comprising most of the remainder. A curtailment of purchasing by any of its significant customers could have an adverse impact on periodic revenues and earnings.

Revenues were $50.5 billion in 2019, an increase of 0.9% compared to 2018. McLane operates on 52/53-week fiscal year and 2019 included an extra week compared to 2018. Otherwise, revenues in 2019 decreased roughly 3% in the grocery business and increased 3% in the foodservice business as compared to 2018. Pre-tax earnings increased $42 million (17.1%) as compared to 2018. The earnings increase in 2019 reflected an increase in average gross margin rates and changes in business mix, partly offset by increased operating expenses, the largest portion of which were employee costs. McLane continues to operate in an intensely competitive business environment, which is negatively affecting its current operating results. We expect these operating conditions will continue.

Manufacturing, Service and Retailing *(Continued)*

McLane Company (Continued)

Revenues were approximately $50.0 billion in 2018, slightly higher than 2017, reflecting a slight increase in grocery sales (1%) and a slight decrease in foodservice sales (1%). The decline in foodservice revenues was primarily due to a net loss of customers. Pre-tax earnings were $246 million, a decline of 17.7%, compared to 2017. McLane's grocery and foodservice businesses continue to operate in a highly competitive business environment, which negatively affected operating results. While gross margin rates increased slightly over 2018, increases in fuel, depreciation and certain other operating expenses more than offset the increase, producing a decline in pre-tax earnings compared to 2017.

Investment and Derivative Gains (Losses)

A summary of investment and derivative gains and losses follows (dollars in millions).

	2019	2018	2017
Investment gains (losses)	$ 71,123	$ (22,155)	$ 1,410
Derivative gains (losses)	1,484	(300)	718
Gains (losses) before income taxes and noncontrolling interests	72,607	(22,455)	2,128
Income taxes and noncontrolling interests	15,162	(4,718)	751
Net gains (losses)	$ 57,445	$ (17,737)	$ 1,377
Effective income tax rate	20.9%	20.8%	34.9%

Investment gains (losses)

Due to a new accounting pronouncement adopted as of January 1, 2018, pre-tax investment gains/losses reported in earnings include unrealized gains and losses arising from changes in market prices on investments in equity securities. Prior to 2018, investment gains/losses related to equity securities were generally recorded as the securities were sold, redeemed or exchanged based on the cost of the disposed securities and the unrealized gains and losses were recorded in other comprehensive income. While the new accounting pronouncement does not affect our consolidated shareholders' equity or total comprehensive income, it has significantly increased the volatility of our periodic net earnings due to the magnitude of our equity securities portfolio and the inherent volatility of equity securities prices. Investment gains and losses from periodic changes in securities prices will continue to cause significant volatility in our consolidated earnings.

Pre-tax investment gains included net unrealized gains of approximately $69.6 billion in 2019 attributable to equity securities we held at December 31, 2019. By comparison, we recorded pre-tax investment losses of approximately $22.7 billion in 2018 attributable to unrealized losses with respect to the equity securities we held at December 31, 2018. Pre-tax net unrealized gains on equity securities of approximately $29 billion in 2017 was recorded in other comprehensive income.

Prior to 2018, investment gains/losses on equity securities were recorded when securities were sold based on the cost of the disposed securities. Taxable investment gains on equity securities sold during the year, which is the difference between sales proceeds and the original cost basis of the securities sold, were $3.2 billion in 2019 and $3.3 billion in 2018.

We believe that investment gains/losses, whether realized from sales or unrealized from changes in market prices, are often meaningless in terms of understanding our reported consolidated earnings or evaluating our periodic economic performance. We continue to believe the investment gains/losses recorded in earnings, including the changes in market prices for equity securities, in any given period has little analytical or predictive value.

Derivative gains (losses)

Derivative contract gains/losses include the changes in fair value of our equity index put option contract liabilities, which relate to contracts that were originated prior to March 2008. Substantially all remaining contracts will expire by February 2023. The periodic changes in the fair values of these liabilities are recorded in earnings and can be significant, primarily due to the volatility of underlying equity markets.

As of December 31, 2019, the intrinsic value of our equity index put option contracts was $397 million and our recorded liability at fair value was $968 million. Our ultimate payment obligations, if any, under our contracts will be determined as of the contract expiration dates based on the intrinsic value as defined under the contracts. Contracts with an aggregate notional value of $12.3 billion expired in 2019.

Investment and Derivative Gains (Losses) *(Continued)*

Derivative gains (losses) (Continued)

Pre-tax gains from equity index put option contracts were $1.5 billion in 2019 compared to pre-tax losses of $300 million in 2018 and gains of $718 million in 2017. The gains in 2019 and 2017 reflected increases in the equity index values and shorter remaining contract durations while the losses in 2018 were primarily due to lower equity index values.

Other

A summary of after-tax other earnings (losses) follows (in millions).

	2019	2018	2017
Equity method earnings (losses)	$ 1,023	$ (1,419)	$ 1,111
Acquisition accounting expenses	(884)	(1,111)	(936)
Corporate interest expense, before foreign currency effects	(280)	(311)	(266)
Foreign currency exchange rate gains (losses) on Berkshire and BHFC non-U.S. Dollar senior notes	58	289	(655)
Income tax expense adjustment	(377)	—	—
Other, principally corporate investment income	884	986	261
Net earnings (losses) attributable to Berkshire Hathaway shareholders	$ 424	$ (1,566)	$ (485)

After-tax equity method earnings include Berkshire's share of earnings attributable to Kraft Heinz, Pilot, Berkadia and Electric Transmission of Texas. After-tax equity method earnings related to our Kraft Heinz investment were earnings of $488 million in 2019, losses of $1,859 million in 2018 and earnings of $972 million in 2017. The after-tax equity method losses in 2018 included approximately $2.7 billion for our share of intangible asset impairment charges recorded by Kraft Heinz.

After-tax acquisition accounting expenses include charges arising from the application of the acquisition method in connection with certain of Berkshire's past business acquisitions. Such charges arise primarily from the amortization or impairment of intangible assets recorded in connection with those business acquisitions.

Foreign currency exchange rate gains and losses pertain to Berkshire's outstanding Euro denominated debt (€6.85 billion par) and Japanese Yen denominated debt (¥430 billion par), issued in September 2019, and BHFC's Great Britain Pound denominated debt (£1.75 billion par), issued in June 2019. Changes in foreign currency exchange rates produced non-cash unrealized gains and losses from the periodic revaluation of these liabilities into U.S. Dollars. The gains and losses recorded in any given period can be significant due the magnitude of the borrowings and the inherent volatility in foreign currency exchange rates.

The income tax expense adjustment relates to investments that were made between 2015 and 2018 in certain tax equity investment funds. Our investments in these funds aggregated approximately $340 million. In December 2018 and during the first quarter of 2019, we learned of allegations by federal authorities of fraudulent conduct by the sponsor of these funds and in January 2020 the principals involved in creating the investment funds plead guilty to criminal charges related to the sale of the investments. As a result, we now believe that it is more likely than not that the income tax benefits that we recognized in prior years are not valid.

Financial Condition

Our consolidated balance sheet continues to reflect significant liquidity and a strong capital base. Consolidated shareholders' equity at December 31, 2019 was $424.8 billion, an increase of $76.1 billion since December 31, 2018. Net earnings attributable to Berkshire shareholders in 2019 were $81.4 billion and included after-tax gains on our investments of approximately $56.3 billion, which were primarily from increases in market prices of the equity securities we owned at December 31, 2019.

At December 31, 2019, our insurance and other businesses held cash, cash equivalents and U.S. Treasury Bills of $125.0 billion, which included $101 billion in U.S. Treasury Bills. Investments in equity and fixed maturity securities (excluding our investment in Kraft Heinz) were $266.7 billion. In August 2019, we paid $10 billion to acquire preferred stock and warrants of Occidental Petroleum Corporation, as discussed in Note 4 to the accompanying Consolidated Financial Statements.

Financial Condition *(Continued)*

Berkshire parent company debt outstanding at December 31, 2019 was $19.9 billion, an increase of $3.0 billion since December 31, 2018. In 2019, Berkshire repaid maturing senior notes of $750 million and issued ¥430 billion of senior notes (approximately $4.0 billion), which has a weighted average interest rate of 0.49% and maturity dates ranging from 2024 to 2049. In March 2020, Berkshire Euro debt of €1.0 billion will mature.

Berkshire's insurance and other subsidiary outstanding borrowings were $17.7 billion at December 31, 2019, which included senior note borrowings of BHFC, a wholly-owned financing subsidiary, of approximately $11.0 billion. BHFC's borrowings are used to fund a portion of loans originated and acquired by Clayton Homes and equipment held for lease by our UTLX railcar leasing business. In 2019, BHFC repaid $3.95 billion of maturing senior notes and issued $2.0 billion of 4.25% senior notes due in 2049, £1.0 billion of 2.375% senior notes due in 2039 and £750 million of 2.625% senior notes due in 2059. Berkshire guarantees the full and timely payment of principal and interest with respect to BHFC's senior notes. In 2020, BHFC debt of $900 million matures, including $350 million that matured in January.

Our railroad, utilities and energy businesses (conducted by BNSF and BHE) maintain very large investments in capital assets (property, plant and equipment) and will regularly make significant capital expenditures in the normal course of business. Capital expenditures of these two operations in 2019 were $11.0 billion and we forecast additional capital expenditures of approximately $10.6 billion in 2020.

BNSF's outstanding debt was $23.2 billion as of December 31, 2019, relatively unchanged since December 31, 2018. In 2019, BNSF issued $825 million of 3.55% senior unsecured debentures due in 2050 and repaid $750 million of maturing debentures. Outstanding borrowings of BHE and its subsidiaries were $42.6 billion at December 31, 2019, an increase of $3.3 billion since December 31, 2018. In 2019, BHE and its subsidiaries issued debt aggregating $4.6 billion with maturity dates ranging from 2029 to 2059 and repaid approximately $1.8 billion of maturing term debt. The proceeds from these financings were used to repay borrowings, fund capital expenditures and for other general corporate purposes. In January 2020, a BHE subsidiary issued $725 million of term debt consisting of $425 million of 2.4% notes due in 2030 and $300 million of 3.125% notes due in 2050. Berkshire does not guarantee the repayment of debt issued by BNSF, BHE or any of their subsidiaries and is not committed to provide capital to support BNSF, BHE or any of their subsidiaries.

Berkshire's common stock repurchase program was amended on July 17, 2018, permitting Berkshire to repurchase its Class A and Class B shares at prices below Berkshire's intrinsic value, as conservatively determined by Warren Buffett, Berkshire's Chairman of the Board and Chief Executive Officer, and Charlie Munger, Vice Chairman of the Board. The program allows share repurchases in the open market or through privately negotiated transactions and does not specify a maximum number of shares to be repurchased. The program is expected to continue indefinitely. We will not repurchase our stock if it reduces the total amount of Berkshire's consolidated cash, cash equivalents and U.S. Treasury Bill holdings below $20 billion. Financial strength and redundant liquidity will always be of paramount importance at Berkshire. In 2019, Berkshire repurchased shares of Class A and B common stock for an aggregate cost of $5.0 billion.

Contractual Obligations

We are party to contracts associated with ongoing business and financing activities, which will result in cash payments to counterparties in future periods. Certain obligations are included in our Consolidated Balance Sheets, such as notes payable, which require future payments on contractually specified dates and in fixed and determinable amounts. Other obligations pertaining to the acquisition of goods or services in the future, such as certain purchase obligations, are not currently reflected in the financial statements, will be recognized in future periods as the goods are delivered or services are provided. Beginning in 2019, operating lease obligations are included in the Consolidated Balance Sheet as a result of the adoption of a new accounting pronouncement. The timing and amount of the payments under certain contracts, such as insurance and reinsurance contracts, are contingent upon the outcome of future events. Actual payments will likely vary, perhaps materially, from the estimated liabilities currently recorded in our Consolidated Balance Sheet.

Contractual Obligations *(Continued)*

A summary of our contractual obligations as of December 31, 2019 follows (in millions). Actual payments will likely vary, perhaps significantly, from estimates reflected in the table.

	Estimated payments due by period				
	Total	**2020**	**2021-2022**	**2023-2024**	**After 2024**
Notes payable and other borrowings, including interest	$ 164,116	$ 14,174	$ 17,358	$ 20,602	$ 111,982
Operating leases	6,879	1,374	2,133	1,384	1,988
Purchase obligations *(1)*	50,092	15,669	9,290	5,430	19,703
Unpaid losses and loss adjustment expenses *(2)*	115,460	26,381	27,818	15,246	46,015
Life, annuity and health insurance benefits *(3)*	35,891	1,903	114	392	33,482
Other	23,285	2,034	3,159	6,466	11,626
Total	$ 395,723	$ 61,535	$ 59,872	$ 49,520	$ 224,796

(1) *Primarily related to fuel, capacity, transmission and maintenance contracts and capital expenditure commitments of BHE and BNSF and aircraft purchase commitments of NetJets.*

(2) *Includes unpaid losses and loss adjustment expenses under retroactive reinsurance contracts.*

(3) *Amounts represent estimated undiscounted benefits, net of estimated future premiums, as applicable.*

Critical Accounting Policies

Certain accounting policies require us to make estimates and judgments in determining the amounts reflected in the Consolidated Financial Statements. Such estimates and judgments necessarily involve varying, and possibly significant, degrees of uncertainty. Accordingly, certain amounts currently recorded in the financial statements will likely be adjusted in the future based on new available information and changes in other facts and circumstances. A discussion of our principal accounting policies that required the application of significant judgments as of December 31, 2019 follows.

Property and casualty losses

We record liabilities for unpaid losses and loss adjustment expenses (also referred to as "gross unpaid losses" or "claim liabilities") based upon estimates of the ultimate amounts payable for losses occurring on or before the balance sheet date. The timing and amount of ultimate loss payments are contingent upon, among other things, the timing of claim reporting from insureds and ceding companies and the final determination of the loss amount through the loss adjustment process. We use a variety of techniques in establishing claim liabilities and all techniques require significant judgments and assumptions.

As of the balance sheet date, recorded claim liabilities include provisions for reported claims, as well as claims not yet reported and the development of reported claims. The period between the loss occurrence date and loss settlement date is the "claim-tail." Property claims usually have relatively short claim-tails, absent litigation. Casualty claims usually have longer claim-tails, occasionally extending for decades. Casualty claims may be more susceptible to litigation and the impact of changing contract interpretations. The legal environment and judicial process further contribute to extending claim-tails.

Our consolidated claim liabilities as of December 31, 2019 were approximately $115.5 billion (including liabilities from retroactive reinsurance), of which 84% related to GEICO and the Berkshire Hathaway Reinsurance Group. Additional information regarding significant uncertainties inherent in the processes and techniques of these businesses follows.

GEICO

GEICO predominantly writes private passenger auto insurance. As of December 31, 2019, GEICO's gross unpaid losses were $22.0 billion. Claim liabilities, net of reinsurance recoverable were $20.9 billion.

GEICO's claim reserving methodologies produce liability estimates based upon the individual claims. The key assumptions affecting our liability estimates include projections of ultimate claim counts ("frequency") and average loss per claim ("severity"). We utilize a combination of several actuarial estimation methods, including Bornhuetter-Ferguson and chain-ladder methodologies.

Claim liability estimates for automobile liability coverages (such as bodily injury ("BI"), uninsured motorists, and personal injury protection) are more uncertain due to the longer claim-tails, so we establish additional case development estimates. As of December 31, 2019, case development liabilities averaged approximately 30% of the case reserves. We select case development factors through analysis of the overall adequacy of historical case liabilities.

Property and casualty losses *(Continued)*

GEICO (Continued)

Incurred-but-not-reported ("IBNR") claims liabilities are based on projections of the ultimate number of claims expected (reported and unreported) for each significant coverage. We use historical claim count data to develop age-to-age projections of the ultimate counts by quarterly accident period, from which we deduct reported claims to produce the number of unreported claims. We estimate the average costs per unreported claim and apply such estimates to the unreported claim counts, producing an IBNR liability estimate. We may record additional IBNR estimates when actuarial techniques are difficult to apply.

We test the adequacy of the aggregate claim liabilities using one or more actuarial projections based on claim closure models and paid and incurred loss triangles. Each type of projection analyzes loss occurrence data for claims occurring in a given period and projects the ultimate cost.

Our claim liability estimates recorded at the end of 2018 increased $42 million during 2019, which produced a corresponding decrease to pre-tax earnings. The assumptions used to estimate liabilities at December 31, 2019 reflect the most recent frequency and severity results. Future development of recorded liabilities will depend on whether actual frequency and severity are more or less than anticipated.

With respect to liabilities for BI claims, we believe it is reasonably possible that average severities will change by at least one percentage point from the severities used in establishing the recorded liabilities at December 31, 2019. We estimate that a one percentage point increase or decrease in BI severities would produce a $295 million increase or decrease in recorded liabilities, with a corresponding decrease or increase in pre-tax earnings. Many of the economic forces that would likely cause BI severity to differ from expectations would likely also cause severities for other injury coverages to differ in the same direction.

Berkshire Hathaway Reinsurance Group

BHRG's liabilities for unpaid losses and loss adjustment expenses derive primarily from reinsurance contracts issued through NICO and General Re. A summary of BHRG's property and casualty unpaid losses and loss adjustment expenses, other than retroactive reinsurance losses and loss adjustment expenses, as of December 31, 2019 follows (in millions).

	Property	Casualty	Total
Reported case liabilities	$ 5,063	$ 9,665	$ 14,728
IBNR liabilities	4,631	12,825	17,456
Gross unpaid losses and loss adjustment expenses	9,694	22,490	32,184
Reinsurance recoverable	268	852	1,120
Net unpaid losses and loss adjustment expenses	$ 9,426	$ 21,638	$ 31,064

Gross unpaid losses and loss adjustment expenses in the table above consist primarily of traditional property and casualty coverages written primarily under excess-of-loss and quota-share treaties. Under certain contracts, coverage can apply to multiple lines of business written and the ceding company may not report loss data by such lines consistently, if at all. In those instances, we allocated losses to property and casualty coverages based on internal estimates.

In connection with reinsurance contracts, the nature, extent, timing and perceived reliability of premium and loss information received from ceding companies varies widely depending on the type of coverage and the contractual reporting terms. Contract terms, conditions and coverages also tend to lack standardization and may evolve more rapidly than primary insurance policies.

The nature and extent of loss information provided under many facultative (individual risk) or per occurrence excess contracts may not differ significantly from the information received under a primary insurance contract. However, loss information is often less detailed with respect to aggregate excess-of-loss and quota-share contracts. Additionally, loss information we receive through periodic reports is often in a summary format rather than on an individual claim basis. Loss data includes recoverable paid losses, as well as case loss estimates. Ceding companies infrequently provide reliable IBNR estimates to reinsurers.

Property and casualty losses *(Continued)*

Berkshire Hathaway Reinsurance Group (Continued)

Loss reporting to reinsurers is typically slower in comparison to primary insurers. In the U.S., such reporting is generally required at quarterly intervals ranging from 30 to 90 days after the end of the quarterly period, while outside of the U.S., reinsurance reporting practices may vary further. In certain countries, clients report annually from 90 to 180 days after the end of the annual period. Reinsurers may assume and cede underlying risks from other reinsurers, which may further delay the reporting of claims. The relative impact of reporting delays on the reinsurer may vary depending on the type of coverage, contractual reporting terms, the magnitude of the claim relative to the attachment point of the reinsurance coverage, and for other reasons.

As reinsurers, the premium and loss data we receive is at least one level removed from the underlying claimant, so there is a risk that the loss data reported is incomplete, inaccurate or the claim is outside the coverage terms. We maintain certain internal procedures in order to determine that the information is complete and in compliance with the contract terms. Generally, our reinsurance contracts permit us to access the ceding company's books and records with respect to the subject business, thus providing the ability to audit the reported information. In the normal course of business, disputes occasionally arise concerning whether claims are covered by our reinsurance policies. We resolve most coverage disputes through negotiation with the client. If disputes cannot be resolved, our contracts generally provide arbitration or alternative dispute resolution processes. There are no coverage disputes at this time for which an adverse resolution would likely have a material impact on our consolidated results of operations or financial condition.

Establishing claim liability estimates for reinsurance requires evaluation of loss information received from our clients. We generally rely on the ceding companies reported case loss estimates. We independently evaluate certain reported case losses and if appropriate, we use our own case liability estimate. For instance, as of December 31, 2019, our case loss estimates exceeded ceding company estimates by approximately $2.0 billion for certain legacy workers' compensation claims occurring over 10 years ago. We also periodically conduct detailed reviews of individual client claims, which may cause us to adjust our case estimates.

Although liabilities for losses are initially determined based on pricing and underwriting analysis, BHRG uses a variety of actuarial methodologies that place reliance on the extrapolation of actual historical data, loss development patterns, industry data, and other benchmarks as appropriate. The estimate of the required IBNR liabilities also requires judgment by actuaries and management to reflect the impact of additional factors like change in business mix, volume, claim reporting and handling practices, inflation, social and legal environment and the terms and conditions of the contracts. The methodologies generally fall into one of the following categories or are hybrids of one or more of the following categories:

Paid and incurred loss development methods – these methods consider expected case loss emergence and development patterns, together with expected loss ratios by year. Factors affecting our loss development analysis include, but are not limited to, changes in the following: client claims reporting and settlement practices; the frequency of client company claim reviews; policy terms and coverage (such as loss retention levels and occurrence and aggregate policy limits); loss trends; and legal trends that result in unanticipated losses. Collectively, these factors influence our selections of expected case loss emergence patterns.

Incurred and paid loss Bornhuetter-Ferguson methods – these methods consider actual paid and incurred losses and expected patterns of paid and incurred losses, taking the initial expected ultimate losses into account to determine an estimate of the expected unpaid or unreported losses.

Frequency and severity methods – these methods commonly focus on a review of the number of anticipated claims and the anticipated claims severity and may also rely on development patterns to derive such estimates. However, our processes and techniques for estimating liabilities in such analyses generally rely more on a per-policy assessment of the ultimate cost associated with the individual loss rather than with an analysis of historical development patterns of past losses.

Additional Analysis – in some cases we have established reinsurance claim liabilities on a contract-by-contract basis, determined from case loss estimates reported by the ceding company and IBNR liabilities that are primarily a function of an anticipated loss ratio for the contract and the reported case loss estimate. Liabilities are adjusted upward or downward over time to reflect case losses reported versus expected case losses, which we use to form revised judgement on the adequacy of the expected loss ratio and the level of IBNR liabilities required for unreported claims. Anticipated loss ratios are also revised to include estimates of known major catastrophe events.

Property and casualty losses *(Continued)*

Berkshire Hathaway Reinsurance Group (Continued)

Our claim liability estimation process for short-tail lines, primarily property exposures, utilizes a combination of the paid and incurred loss development methods and the incurred and paid loss Bornhuetter-Ferguson methods. Certain catastrophe, individual risk and aviation excess-of-loss contracts tend to generate low frequency/high severity losses. Our processes and techniques for estimating liabilities under such contracts generally rely more on a per contract assessment of the ultimate cost associated with the individual loss event rather than with an analysis of the historical development patterns of past losses.

For our long-tail lines, primarily casualty exposures, we may rely on different methods depending on the maturity of the business, with estimates for the most recent years being based on priced loss expectations and more mature years reflecting the paid or incurred development pattern indications.

In 2019, certain workers' compensation claims reported losses were less than expected. As a result, we reduced estimated ultimate losses for prior years' loss events by $150 million. We estimate that increases of ten percent in the tail of the expected loss emergence pattern and in the expected loss ratios would produce a net increase of approximately $1.1 billion in IBNR liabilities, producing a corresponding decrease in pre-tax earnings. We believe it is reasonably possible for these assumptions to increase at these rates.

We also reduced estimated ultimate losses for prior years' events for other casualty losses, excluding asbestos, environmental, and other latent injury claims, by $23 million, reflecting lower than expected reported losses. For certain significant casualty and general liability portfolios, we estimate that increases of five percent in the claim-tails of the expected loss emergence patterns and in the expected loss ratios would produce a net increase in our nominal IBNR liabilities and a corresponding reduction in pre-tax earnings of approximately $850 million, although outcomes of less than $850 million are quite possible given the diversification in worldwide business.

Estimated ultimate liabilities for asbestos, environmental and other latent injury claims were increased approximately $150 million in 2019, which produced a corresponding reduction in pre-tax earnings. Net liabilities for such claims, excluding amounts assumed under retroactive reinsurance contracts, were approximately $1.7 billion at December 31, 2019. Loss estimations for these exposures are difficult to determine due to the changing legal environment and increases may be required in the future if new exposures or claimants are identified, new claims are reported or new theories of liability emerge.

Retroactive reinsurance

Our retroactive reinsurance contracts cover loss events occurring before the contract inception dates. Claim liabilities relating to our retroactive reinsurance contracts are predominately related to casualty or liability exposures. We expect the claim-tails to be very long. Our gross unpaid losses, deferred charge assets, and net liabilities at December 31, 2019 were as follows (in millions).

Gross unpaid losses	Deferred charges	Liabilities, net of deferred charges
$ 42,441	$ (13,747)	$ 28,694

Our contracts are generally subject to maximum limits of indemnifications and, as such, we currently expect that maximum remaining gross losses payable under our retroactive policies will not exceed $56 billion. Absent significant judicial or legislative changes affecting asbestos, environmental or latent injury exposures, we also currently believe it unlikely that losses will develop upward to the maximum losses payable or downward by more than 15% of our $42.4 billion estimated liability.

We establish liability estimates by individual contract, considering exposure and development trends. In establishing our liability estimates, we often analyze historical aggregate loss payment patterns and project expected ultimate losses under various scenarios. We assign judgmental probability factors to these scenarios and an expected outcome is determined. We then monitor subsequent loss payment activity and review ceding company reports and other available information concerning the underlying losses. We re-estimate the expected ultimate losses when significant events or significant deviations from expected results are revealed.

Property and casualty losses *(Continued)*

Retroactive reinsurance (Continued)

Certain of our retroactive reinsurance contracts include asbestos, environmental and other latent injury claims. Our estimated liabilities for such claims were approximately $12.9 billion at December 31, 2019. We do not consistently receive reliable detailed data regarding asbestos, environmental and latent injury claims from all ceding companies, particularly with respect to multi-line or aggregate excess-of-loss policies. When possible, we conduct a detailed analysis of the underlying loss data to make an estimate of ultimate reinsured losses. When detailed loss information is unavailable, we develop estimates by applying recent industry trends and projections to aggregate client data. Judgments in these areas necessarily consider the stability of the legal and regulatory environment under which we expect these claims will be adjudicated. Legal reform and legislation could also have a significant impact on our ultimate liabilities.

We increased estimated ultimate liabilities for prior years' retroactive reinsurance contracts by $378 million in 2019, which after the changes in related deferred charge assets, resulted in pre-tax losses of $125 million. In 2019, we paid losses and loss adjustment expenses of $909 million with respect to these contracts.

In connection with our retroactive reinsurance contracts, we also record deferred charge assets, which at contract inception represents the excess, if any, of the estimated ultimate liability for unpaid losses over premiums. We amortize deferred charge assets, which produces charges to pre-tax earnings in future periods based on the expected timing and amount of loss payments. We also adjust deferred charge balances due to changes in the expected timing and ultimate amount of claim payments. Significant changes in such estimates may have a significant effect on unamortized deferred charge balances and the amount of periodic amortization. Based on the contracts in effect as of December 31, 2019, we currently estimate that amortization expense in 2020 will approximate $1.2 billion.

Other Critical Accounting Policies

Our Consolidated Balance Sheet at December 31, 2019 included goodwill of acquired businesses of $81.9 billion and other indefinite-lived intangible assets of $19.0 billion. We evaluate these assets for impairment at least annually and we conducted our most recent annual review during the fourth quarter of 2019. Our review of goodwill includes determining the estimated fair values of our reporting units. Our review of other indefinite-lived intangible assets includes determining an estimated fair value of the asset.

We primarily use discounted projected future earnings or cash flow methods in determining fair values. The key assumptions and inputs used in such methods may include forecasting revenues and expenses, cash flows and capital expenditures, as well as an appropriate discount rate and other inputs. A significant amount of judgment is required in estimating the fair value of a reporting unit and in performing goodwill impairment tests.

Due to the inherent uncertainty in forecasting cash flows and earnings, actual results may vary significantly from the forecasts. If the carrying value of the indefinite-lived intangible asset exceeds fair value, the excess is charged to earnings as an impairment loss. If the carrying value of a reporting unit exceeds the estimated fair value of the reporting unit, then, as required by GAAP, the excess, limited to the carrying amount of goodwill, will be charged to earnings as an impairment loss.

Market Risk Disclosures

Our Consolidated Balance Sheets include substantial amounts of assets and liabilities whose fair values are subject to market risks. Our significant market risks are primarily associated with equity prices, interest rates, foreign currency exchange rates and commodity prices. The fair values of our investment portfolios and equity index put option contracts remain subject to considerable volatility. The following sections address the significant market risks associated with our business activities.

Equity Price Risk

Equity securities represent a significant portion of our investment portfolio. Strategically, we strive to invest in businesses that possess excellent economics and able and honest management, and we prefer to invest a meaningful amount in each investee. Consequently, equity investments are concentrated in relatively few issuers. At December 31, 2019, approximately 67% of the total fair value of equity securities was concentrated in five issuers.

We often hold our equity investments for long periods and short-term price volatility has occurred in the past and will occur in the future. We also strive to maintain significant levels of shareholder capital and ample liquidity to provide a margin of safety against short-term price volatility.

We are also subject to equity price risk with respect to our equity index put option contracts. While our ultimate liability with respect to these contracts is determined from the movement of the underlying stock index between the contract inception date and expiration date, fair values of these contracts are also affected by changes in other factors such as interest rates, expected dividend rates and the remaining duration of the contracts.

The following table summarizes our equity securities and derivative contract liabilities with significant equity price risk as of December 31, 2019 and 2018 and the estimated effects of a hypothetical 30% increase and a 30% decrease in market prices as of those dates. The selected 30% hypothetical increase and decrease does not reflect the best or worst case scenario. Indeed, results from declines could be far worse due both to the nature of equity markets and the aforementioned concentrations existing in our equity investment portfolio. Dollar amounts are in millions.

	Fair Value	Hypothetical Price Change	Estimated Fair Value after Hypothetical Change in Prices	Hypothetical Percentage Increase (Decrease) in Shareholders' Equity *(1)*
December 31, 2019				
Investments in equity securities	$ 248,027	30% increase	$ 319,445	13.3%
		30% decrease	176,749	(13.3)
Equity index put option contract liabilities	968	30% increase	267	0.1
		30% decrease	2,776	(0.3)
December 31, 2018				
Investments in equity securities	$ 172,757	30% increase	$ 224,584	11.7%
		30% decrease	120,930	(11.7)
Equity index put option contract liabilities	2,452	30% increase	1,131	0.3
		30% decrease	5,362	(0.7)

(1) *The hypothetical percentage increase (decrease) is after income taxes at the statutory rate in effect as of the balance sheet date.*

Interest Rate Risk

We may also invest in bonds, loans or other interest rate sensitive instruments. Our strategy is to acquire or originate such instruments at prices considered appropriate relative to the perceived credit risk. We also issue debt in the ordinary course of business to fund business operations, business acquisitions and for other general purposes. We attempt to maintain high credit ratings, in order to minimize the cost of our debt. We infrequently utilize derivative products, such as interest rate swaps, to manage interest rate risks.

The fair values of our fixed maturity investments, loans and finance receivables, and notes payable and other borrowings will fluctuate in response to changes in market interest rates. In addition, changes in interest rate assumptions used in our equity index put option contract models cause changes in reported liabilities with respect to those contracts. Increases and decreases in interest rates generally translate into decreases and increases in fair values of these instruments. Additionally, fair values of interest rate sensitive instruments may be affected by the creditworthiness of the issuer, prepayment options, relative values of alternative investments, the liquidity of the instrument and other general market conditions.

Interest Rate Risk *(Continued)*

The following table summarizes the estimated effects of hypothetical changes in interest rates on our significant assets and liabilities that are subject to significant interest rate risk at December 31, 2019 and 2018. We assumed that the interest rate changes occur immediately and uniformly to each category of instrument and that there were no significant changes to other factors used to determine the value of the instrument. The hypothetical changes in interest rates do not reflect the best or worst case scenarios. Actual results may differ from those reflected in the table. Dollars are in millions.

		Estimated Fair Value after Hypothetical Change in Interest Rates (bp=basis points)			
	Fair Value	100 bp decrease	100 bp increase	200 bp increase	300 bp increase
December 31, 2019					
Assets:					
Investments in fixed maturity securities	$ 18,685	$ 19,008	$ 18,375	$ 18,075	$ 17,787
Investments in equity securities*	10,314	11,016	9,671	9,081	8,539
Loans and finance receivables	17,861	18,527	17,240	16,660	16,116
Liabilities:					
Notes payable and other borrowings:					
Insurance and other	40,589	44,334	37,454	34,799	32,534
Railroad, utilities and energy	76,237	84,758	69,160	63,218	58,193
Equity index put option contracts	968	1,065	877	792	713
December 31, 2018					
Assets:					
Investments in fixed maturity securities	$ 19,898	$ 20,260	$ 19,549	$ 19,214	$ 18,891
Loans and finance receivables	16,377	17,006	15,844	15,318	14,823
Liabilities:					
Notes payable and other borrowings:					
Insurance and other	35,361	37,559	33,380	31,691	30,208
Railroad, utilities and energy	66,422	73,063	60,840	56,107	52,063
Equity index put option contracts	2,452	2,669	2,249	2,057	1,877

(*) Occidental Petroleum Cumulative Perpetual Preferred Stock

Foreign Currency Risk

Certain of our subsidiaries operate in foreign jurisdictions and we transact business in foreign currencies. In addition, we hold investments in common stocks of major multinational companies, such as The Coca-Cola Company, who have significant foreign business and foreign currency risk of their own. We generally do not attempt to match assets and liabilities by currency and do not use derivative contracts to manage foreign currency risks in any meaningful way.

Our net assets subject to financial statement translation into U.S. Dollars are primarily in our insurance, utilities and energy and certain manufacturing and services subsidiaries. A portion of our financial statement translation-related impact from changes in foreign currency rates is recorded in other comprehensive income. In addition, we include gains or losses in net earnings related to certain liabilities of Berkshire and U.S. insurance subsidiaries that are denominated in foreign currencies, due to changes in exchange rates. A summary of these gains (losses), after-tax, for each of the years ending December 31, 2019 and 2018 follows (in millions).

	2019	2018
Non-U.S. denominated debt included in net earnings	$ 58	$ 289
Net liabilities under certain reinsurance contracts included in net earnings	(92)	207
Foreign currency translation included in other comprehensive income	257	(1,424)

Commodity Price Risk

Our subsidiaries use commodities in various ways in manufacturing and providing services. As such, we are subject to price risks related to various commodities. In most instances, we attempt to manage these risks through the pricing of our products and services to customers. To the extent that we are unable to sustain price increases in response to commodity price increases, our operating results will likely be adversely affected. We do not utilize derivative contracts to manage commodity price risks to any significant degree.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

See "Market Risk Disclosures" contained in Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Management's Report on Internal Control Over Financial Reporting

Management of Berkshire Hathaway Inc. is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in the Securities Exchange Act of 1934 Rule 13a-15(f). Under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of the Company's internal control over financial reporting as of December 31, 2019 as required by the Securities Exchange Act of 1934 Rule 13a-15(c). In making this assessment, we used the criteria set forth in the framework in *Internal Control—Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on our evaluation under the framework in *Internal Control—Integrated Framework* (2013), our management concluded that our internal control over financial reporting was effective as of December 31, 2019.

The effectiveness of our internal control over financial reporting as of December 31, 2019 has been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report which appears on page K-63.

Berkshire Hathaway Inc.
February 22, 2020

Item 8. Financial Statements and Supplementary Data

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of
Berkshire Hathaway Inc.
Omaha, Nebraska

Opinions on the Financial Statements and Internal Control over Financial Reporting
We have audited the accompanying consolidated balance sheets of Berkshire Hathaway Inc. and subsidiaries (the "Company") as of December 31, 2019 and 2018, the related consolidated statements of earnings, comprehensive income, changes in shareholders' equity, and cash flows, for each of the three years in the period ended December 31, 2019, and the related notes (collectively referred to as the "financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019, in conformity with accounting principles generally accepted in the United States of America. Also, in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by COSO.

Change in Accounting Principle
As discussed in Note 1 to the financial statements, the Company has changed its method of accounting for investments in equity securities (excluding equity method investments) in 2018 due to the adoption of *ASU 2016-01 "Financial Instruments – Recognition and Measurement of Financial Assets and Financial Liabilities."*

Basis for Opinions
The Company's management is responsible for these financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on these financial statements and an opinion on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the US federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the financial statements included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures to respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting
A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current-period audit of the financial statements that were communicated or required to be communicated to the audit committee and that (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Unpaid Losses and Loss Adjustment Expenses— Refer to Notes 1 and 15 to the financial statements

Critical Audit Matter Description

The Company's unpaid losses and loss adjustment expenses ("claim liabilities") under short duration property and casualty insurance and reinsurance contracts are $73,019 million as of December 31, 2019. The key assumptions affecting certain claim liabilities include expected loss and expense ("loss") ratios, expected claim count emergence patterns, expected loss payment emergence patterns and expected loss reporting emergence patterns.

Given the subjectivity of estimating these key assumptions, performing audit procedures to evaluate whether claim liabilities were appropriately recorded as of December 31, 2019, required a high degree of auditor judgment and an increased extent of effort, including the need to involve our actuarial specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the key assumptions affecting certain claim liabilities included the following, among others:

- We tested the operating effectiveness of controls over claim liabilities, including those over the key assumptions.
- We evaluated the methods and assumptions used by management to estimate the claim liabilities by:
  - Testing the underlying data that served as the basis for the actuarial analysis, such as historical claims and earned premium, to test that the inputs to the actuarial estimate were reasonable.
  - Comparing management's prior-year claim liabilities to actual development during the current year to identify potential bias in the determination of the claim liabilities.
- With the assistance of our actuarial specialists:
  - We developed independent estimates of the claim liabilities, including loss data and industry claim development factors as needed, and compared our estimates to management's estimates.
  - We compared management's change in ultimate loss and loss adjustment expense to prior year estimates to test the reasonableness of the prior year estimates and assessed unexpected development.

Unpaid Losses and Loss Adjustment Expenses Under Retroactive Reinsurance Contracts — Refer to Notes 1 and 16 to the financial statements

Critical Audit Matter Description

The Company's unpaid losses and loss adjustment expenses ("claim liabilities") for property and casualty retroactive reinsurance contracts are $42,441 million as of December 31, 2019. The key assumptions affecting certain claim liabilities and related deferred charge reinsurance assumed assets ("related assets"), include expected loss expense ("loss") ratios, expected loss payment emergence patterns and expected loss reporting emergence.

Given the subjectivity of estimating these key assumptions, performing audit procedures to evaluate whether claim liabilities were appropriately recorded as of December 31, 2019, required a high degree of auditor judgment and an increased extent of effort, including the need to involve our actuarial specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the key assumptions affecting claim liabilities and related assets included the following, among others:

- We tested the operating effectiveness of controls over claim liabilities and related assets, including those over the key assumptions.

- We evaluated the methods and assumptions used by management to estimate the claim liabilities and related assets by:
  - Testing the underlying data that served as the basis for the actuarial analysis, including historical claims, to test that the inputs to the actuarial estimate were reasonable.
  - Comparing management's prior-year claim liabilities to actual development during the current year to identify potential bias in the determination of the claim liabilities and related assets.
- With the assistance of our actuarial specialists:
  - We developed independent claim liability estimates for certain retroactive reinsurance contracts and compared our estimates to management's estimates. For other retroactive reinsurance contracts and related assets, we evaluated the process used by management to develop the estimated claim liabilities and related assets.
  - We compared management's change in ultimate loss and loss adjustment expense to prior year estimates, assessed unexpected development and assessed internal rates of return.

Goodwill and Indefinite-Lived Intangible Assets — Refer to Notes 1, 13, and 27 to the financial statements

Critical Audit Matter Description

The Company's evaluation of goodwill and indefinite-lived intangible assets for impairment involves the comparison of the fair value of each reporting unit or asset to its carrying value. The Company evaluates goodwill and indefinite-lived intangible assets for impairment at least annually. When evaluating goodwill and indefinite-lived intangible assets for impairment, the fair value of each reporting unit or asset is estimated. Significant judgment is required in estimating fair values and performing impairment tests. The Company primarily uses discounted projected future earnings or cash flow methods to estimate fair value, which requires management to make significant estimates and assumptions related to forecasts of future revenue, earnings before interest and taxes ("EBIT"), and discount rate. Changes in these assumptions could have a significant impact on the fair value of reporting units and indefinite-lived intangible assets.

A reporting unit within the Manufacturing reportable segment, which had goodwill at acquisition date of $16,011 million, was an acquisition made by the Company in 2016. This subsidiary also has certain customer relationships that are intangible assets with indefinite lives. These customer relationships are a significant portion of the $18,965 million of indefinite-lived intangible assets the Company reported as of December 31, 2019. The fair values of the reporting unit and customer relationships exceeded their carrying values as of the annual evaluation date; therefore, no impairments were recognized.

Given the significant judgments made by management to estimate the fair value of this reporting unit and the customer relationships and the difference between their fair values and carrying values, performing audit procedures to evaluate the reasonableness of management's estimates and assumptions related to forecasts of future revenue and EBIT and the selection of the discount rates required a high degree of auditor judgment and an increased extent of effort, including the need to involve our fair value specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to forecasts of future revenue and EBIT and selection of the discount rates for the reporting unit and customer relationships included the following, among others:

- We tested the effectiveness of controls over goodwill and indefinite-lived intangible assets, including those over the forecasts of future revenue and EBIT.
- We evaluated management's ability to accurately forecast future revenue and EBIT by comparing prior year forecasts to actual results in the respective years.
- We evaluated the reasonableness of management's current revenue and EBIT forecasts by comparing the forecasts to historical results and forecasted information included in analyst and industry reports and certain peer companies' disclosures.
- With the assistance of our fair value specialists, we evaluated the valuation methodologies, the long-term growth rates and discount rates, including testing the underlying source information and the mathematical accuracy of the calculations, and developed a range of independent estimates and compared those to the long-term growth rates and discount rates selected by management.

/s/ Deloitte & Touche LLP
Omaha, Nebraska
February 22, 2020

We have served as the Company's auditor since 1985.

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED BALANCE SHEETS
(dollars in millions)

	December 31, 2019	December 31, 2018
ASSETS		
Insurance and Other:		
Cash and cash equivalents*	$ 61,151	$ 27,749
Short-term investments in U.S. Treasury Bills	63,822	81,506
Investments in fixed maturity securities	18,685	19,898
Investments in equity securities	248,027	172,757
Equity method investments	17,505	17,325
Loans and finance receivables	17,527	16,280
Other receivables	32,418	31,564
Inventories	19,852	19,069
Property, plant and equipment	21,438	20,628
Equipment held for lease	15,065	14,298
Goodwill	57,052	56,323
Other intangible assets	31,051	31,499
Deferred charges under retroactive reinsurance contracts	13,747	14,104
Other	13,232	9,307
	630,572	532,307
Railroad, Utilities and Energy:		
Cash and cash equivalents*	3,024	2,612
Receivables	3,417	3,666
Property, plant and equipment	137,838	131,780
Goodwill	24,830	24,702
Regulatory assets	2,881	3,067
Other	15,167	9,660
	187,157	175,487
	$ 817,729	$ 707,794

* *Cash and cash equivalents includes U.S. Treasury Bills with maturities of three months or less when purchased of $37.1 billion at December 31, 2019 and $3.9 billion at December 31, 2018.*

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED BALANCE SHEETS
(dollars in millions)

	December 31, 2019	December 31, 2018
LIABILITIES AND SHAREHOLDERS' EQUITY		
Insurance and Other:		
Unpaid losses and loss adjustment expenses	$ 73,019	$ 68,458
Unpaid losses and loss adjustment expenses under retroactive reinsurance contracts	42,441	41,834
Unearned premiums	19,782	18,093
Life, annuity and health insurance benefits	20,155	18,632
Other policyholder liabilities	7,723	7,675
Accounts payable, accruals and other liabilities	27,611	25,776
Derivative contract liabilities	968	2,452
Aircraft repurchase liabilities and unearned lease revenues	5,281	4,593
Notes payable and other borrowings	37,590	34,975
	234,570	222,488
Railroad, Utilities and Energy:		
Accounts payable, accruals and other liabilities	14,708	11,410
Regulatory liabilities	7,311	7,506
Notes payable and other borrowings	65,778	62,515
	87,797	81,431
Income taxes, principally deferred	66,799	51,375
Total liabilities	389,166	355,294
Shareholders' equity:		
Common stock	8	8
Capital in excess of par value	35,658	35,707
Accumulated other comprehensive income	(5,243)	(5,015)
Retained earnings	402,493	321,112
Treasury stock, at cost	(8,125)	(3,109)
Berkshire Hathaway shareholders' equity	424,791	348,703
Noncontrolling interests	3,772	3,797
Total shareholders' equity	428,563	352,500
	$ 817,729	$ 707,794

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF EARNINGS
(dollars in millions except per share amounts)

	Year Ended December 31,		
	2019	**2018**	**2017**
Revenues:			
Insurance and Other:			
Insurance premiums earned	$ 61,078	$ 57,418	$ 60,597
Sales and service revenues	134,989	133,336	130,343
Leasing revenues	5,856	5,732	2,452
Interest, dividend and other investment income	9,240	7,678	6,536
	211,163	204,164	199,928
Railroad, Utilities and Energy:			
Freight rail transportation revenues	23,357	23,703	21,080
Energy operating revenues	15,353	15,555	15,155
Service revenues and other income	4,743	4,415	3,770
	43,453	43,673	40,005
Total revenues	254,616	247,837	239,933
Investment and derivative contract gains (losses):			
Investment gains (losses)	71,123	(22,155)	1,410
Derivative contract gains (losses)	1,484	(300)	718
	72,607	(22,455)	2,128
Costs and expenses:			
Insurance and Other:			
Insurance losses and loss adjustment expenses	44,456	39,906	48,891
Life, annuity and health insurance benefits	4,986	5,699	5,618
Insurance underwriting expenses	11,200	9,793	9,321
Cost of sales and services	107,041	106,083	104,343
Cost of leasing	4,003	4,061	1,455
Selling, general and administrative expenses	19,322	18,238	19,189
Interest expense	1,056	1,035	1,132
	192,064	184,815	189,949
Railroad, Utilities and Energy:			
Freight rail transportation expenses	15,436	16,045	14,031
Utilities and energy cost of sales and other expenses	11,296	11,641	10,772
Other expenses	4,002	3,895	3,231
Interest expense	2,905	2,818	3,254
	33,639	34,399	31,288
Total costs and expenses	225,703	219,214	221,237
Earnings before income taxes and equity method earnings (losses)	101,520	6,168	20,824
Equity method earnings (losses)	1,176	(2,167)	3,014
Earnings before income taxes	102,696	4,001	23,838
Income tax expense (benefit)	20,904	(321)	(21,515)
Net earnings	81,792	4,322	45,353
Earnings attributable to noncontrolling interests	375	301	413
Net earnings attributable to Berkshire Hathaway shareholders	$ 81,417	$ 4,021	$ 44,940
Net earnings per average equivalent Class A share	$ 49,828	$ 2,446	$ 27,326
Net earnings per average equivalent Class B share*	$ 33.22	$ 1.63	$ 18.22
Average equivalent Class A shares outstanding	1,633,946	1,643,795	1,644,615
Average equivalent Class B shares outstanding	2,450,919,020	2,465,692,368	2,466,923,163

* *Class B shares are economically equivalent to one-fifteen-hundredth of a Class A share. Accordingly, net earnings per average equivalent Class B share outstanding is equal to one-fifteen-hundredth of the equivalent Class A amount. See Note 21.*

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(dollars in millions)

	Year Ended December 31,		
	2019	**2018**	**2017**
Net earnings	$ 81,792	$ 4,322	$ 45,353
Other comprehensive income:			
Net change in unrealized appreciation of investments	204	(185)	30,450
Applicable income taxes	(44)	31	(10,566)
Reclassification of investment appreciation in net earnings	(62)	(253)	(1,399)
Applicable income taxes	13	53	490
Foreign currency translation	323	(1,531)	2,364
Applicable income taxes	(28)	62	(95)
Prior service cost and actuarial gains/losses of defined benefit pension plans	(711)	(571)	225
Applicable income taxes	155	143	(45)
Other, net	(48)	(12)	(9)
Other comprehensive income, net	(198)	(2,263)	21,415
Comprehensive income	81,594	2,059	66,768
Comprehensive income attributable to noncontrolling interests	405	249	555
Comprehensive income attributable to Berkshire Hathaway shareholders	$ 81,189	$ 1,810	$ 66,213

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY
(dollars in millions)

	Berkshire Hathaway shareholders' equity					
	Common stock and capital in excess of par value	**Accumulated other comprehensive income**	**Retained earnings**	**Treasury stock**	**Non-controlling interests**	**Total**
Balance December 31, 2016	$ 35,689	$37,298	$210,846	$ (1,763)	$ 3,358	$285,428
Net earnings	—	—	44,940	—	413	45,353
Other comprehensive income, net	—	21,273	—	—	142	21,415
Issuance of common stock	76	—	—	—	—	76
Transactions with noncontrolling interests	(63)	—	—	—	(255)	(318)
Balance December 31, 2017	35,702	58,571	255,786	(1,763)	3,658	351,954
Adoption of new accounting pronouncements	—	(61,375)	61,305	—	—	(70)
Net earnings	—	—	4,021	—	301	4,322
Other comprehensive income, net	—	(2,211)	—	—	(52)	(2,263)
Issuance (acquisition) of common stock	59	—	—	(1,346)	—	(1,287)
Transactions with noncontrolling interests	(46)	—	—	—	(110)	(156)
Balance December 31, 2018	35,715	(5,015)	321,112	(3,109)	3,797	352,500
Net earnings			81,417		375	81,792
Other comprehensive income, net		(228)			30	(198)
Issuance (acquisition) of common stock	21			(5,016)		(4,995)
Transactions with noncontrolling interests	(70)		(36)		(430)	(536)
Balance December 31, 2019	$ 35,666	$ (5,243)	$402,493	$ (8,125)	$ 3,772	$428,563

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF CASH FLOWS
(dollars in millions)

	Year Ended December 31,		
	2019	**2018**	**2017**
Cash flows from operating activities:			
Net earnings	$ 81,792	$ 4,322	$ 45,353
Adjustments to reconcile net earnings to operating cash flows:			
Investment gains/losses	(71,123)	22,155	(1,410)
Depreciation and amortization	10,064	9,779	9,188
Other	(1,254)	2,957	458
Changes in operating assets and liabilities:			
Losses and loss adjustment expenses	6,087	3,449	25,027
Deferred charges reinsurance assumed	357	1,174	(7,231)
Unearned premiums	1,707	1,794	1,761
Receivables and originated loans	(2,303)	(3,443)	(1,990)
Other assets	(2,011)	(1,832)	(1,665)
Other liabilities	190	2,002	1,194
Income taxes	15,181	(4,957)	(24,957)
Net cash flows from operating activities	38,687	37,400	45,728
Cash flows from investing activities:			
Purchases of equity securities	(18,642)	(43,210)	(20,326)
Sales and redemptions of equity securities	14,336	18,783	19,512
Purchases of U.S. Treasury Bills and fixed maturity securities	(136,123)	(141,844)	(158,492)
Sales of U.S. Treasury Bills and fixed maturity securities	15,929	39,693	49,327
Redemptions and maturities of U.S. Treasury Bills and fixed maturity securities	137,767	113,045	86,727
Purchases of loans and finance receivables	(75)	(1,771)	(1,435)
Collections of loans and finance receivables	345	342	1,702
Acquisitions of businesses, net of cash acquired	(1,683)	(3,279)	(2,708)
Purchases of property, plant and equipment and equipment held for lease	(15,979)	(14,537)	(11,708)
Other	(1,496)	(71)	(3,608)
Net cash flows from investing activities	(5,621)	(32,849)	(41,009)
Cash flows from financing activities:			
Proceeds from borrowings of insurance and other businesses	8,144	2,409	2,645
Repayments of borrowings of insurance and other businesses	(5,095)	(7,395)	(5,465)
Proceeds from borrowings of railroad, utilities and energy businesses	5,400	7,019	3,013
Repayments of borrowings of railroad, utilities and energy businesses	(2,638)	(4,213)	(3,549)
Changes in short term borrowings, net	266	(1,943)	2,079
Acquisition of treasury stock	(4,850)	(1,346)	—
Other	(497)	(343)	(121)
Net cash flows from financing activities	730	(5,812)	(1,398)
Effects of foreign currency exchange rate changes	25	(140)	248
Increase (decrease) in cash and cash equivalents and restricted cash	33,821	(1,401)	3,569
Cash and cash equivalents and restricted cash at beginning of year	30,811	32,212	28,643
Cash and cash equivalents and restricted cash at end of year *	$ 64,632	$ 30,811	$ 32,212
** Cash and cash equivalents and restricted cash at end of year are comprised of the following:*			
Insurance and Other	*$ 61,151*	*$ 27,749*	*$ 28,673*
Railroad, Utilities and Energy	*3,024*	*2,612*	*2,910*
Restricted cash, included in other assets	*457*	*450*	*629*
	$ 64,632	*$ 30,811*	*$ 32,212*

See accompanying Notes to Consolidated Financial Statements

BERKSHIRE HATHAWAY INC.
and Subsidiaries
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
December 31, 2019

(1) Significant accounting policies and practices

(a) Nature of operations and basis of consolidation

Berkshire Hathaway Inc. ("Berkshire") is a holding company owning subsidiaries engaged in a number of diverse business activities, including insurance and reinsurance, freight rail transportation, utilities and energy, manufacturing, service and retailing. In these notes the terms "us," "we," or "our" refer to Berkshire and its consolidated subsidiaries. Further information regarding our reportable business segments is contained in Note 27. Information concerning business acquisitions completed over the past three years appears in Note 2. We believe that reporting the Railroad, Utilities and Energy subsidiaries separately is appropriate given the relative significance of their long-lived assets, capital expenditures and debt, which is not guaranteed by Berkshire.

The accompanying Consolidated Financial Statements include the accounts of Berkshire consolidated with the accounts of all subsidiaries and affiliates in which we hold a controlling financial interest as of the financial statement date. Normally a controlling financial interest reflects ownership of a majority of the voting interests. We consolidate variable interest entities ("VIE") when we possess both the power to direct the activities of the VIE that most significantly affect its economic performance, and we (a) are obligated to absorb the losses that could be significant to the VIE or (b) hold the right to receive benefits from the VIE that could be significant to the VIE. Intercompany accounts and transactions have been eliminated.

(b) Use of estimates in preparation of financial statements

The preparation of our Consolidated Financial Statements in conformity with accounting principles generally accepted in the United States ("GAAP") requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities at the balance sheet date and the reported amounts of revenues and expenses during the period. In particular, estimates of unpaid losses and loss adjustment expenses are subject to considerable estimation error due to the inherent uncertainty in projecting ultimate claim costs. In addition, estimates and assumptions associated with the amortization of deferred charges on retroactive reinsurance contracts, determinations of fair values of certain financial instruments and evaluations of goodwill and identifiable intangible assets for impairment require considerable judgment. Actual results may differ from the estimates used in preparing our Consolidated Financial Statements.

(c) Cash and cash equivalents and short-term investments in U.S. Treasury Bills

Cash equivalents consist of demand deposit and money market accounts and investments (including U.S. Treasury Bills) with maturities of three months or less when purchased. Short-term investments in U.S. Treasury Bills consist of U.S. Treasury Bills with maturities exceeding three months at the time of purchase and are stated at amortized cost, which approximates fair value.

(d) Investments in fixed maturity securities

We classify investments in fixed maturity securities at the acquisition date and re-evaluate the classification at each balance sheet date. Securities classified as held-to-maturity are carried at amortized cost, reflecting the ability and intent to hold the securities to maturity. Securities classified as trading are acquired with the intent to sell in the near term and are carried at fair value with changes in fair value reported in earnings. All other securities are classified as available-for-sale and are carried at fair value with net unrealized gains or losses reported in accumulated other comprehensive income. As of December 31, 2019, substantially all of our investments in fixed maturity securities were classified as available-for-sale. We amortize the difference between the original cost and maturity value of a fixed maturity security to earnings using the interest method.

Investment gains and losses for available-for-sale fixed maturity securities are recorded when the securities are sold, as determined on a specific identification basis. If the fair value of a fixed maturity security is less than cost, we evaluate the security for other-than-temporary impairment. We recognize an other-than-temporary impairment if we (a) intend to sell or expect to be required to sell the security before its amortized cost is recovered or (b) do not expect to ultimately recover the amortized cost basis even if we do not intend to sell the security. Under scenario (a), we recognize the loss in earnings and under scenario (b), we recognize the credit loss component in earnings and the remainder in other comprehensive income.

(1) Significant accounting policies and practices *(Continued)*

(e) Investments in equity securities

We carry substantially all of our investments in equity securities at fair value and record the subsequent changes in fair values in the Consolidated Statement of Earnings as a component of investment gains/losses. Prior to January 1, 2018, substantially all of our equity security investments were classified as available-for-sale and were also carried at fair value. However, we recorded the periodic changes in fair value of these securities as components of other comprehensive income. In addition, we recorded gains and losses in the Consolidated Statements of Earnings when equity securities were sold (on a specific identification basis) or were other-than-temporarily impaired.

(f) Investments under the equity method

We utilize the equity method to account for investments when we possess the ability to exercise significant influence, but not control, over the operating and financial policies of the investee. The ability to exercise significant influence is presumed when the investor possesses more than 20% of the voting interests of the investee. This presumption may be overcome based on specific facts and circumstances that demonstrate that the ability to exercise significant influence is restricted. We apply the equity method to investments in common stock and to other investments when such other investments possess substantially identical subordinated interests to common stock.

In applying the equity method, we record the investment at cost and subsequently increase or decrease the carrying amount of the investment by our proportionate share of the net earnings or losses and other comprehensive income of the investee. We record dividends or other equity distributions as reductions in the carrying value of the investment. In the event that net losses of the investee reduce the carrying amount to zero, additional net losses may be recorded if other investments in the investee are at-risk, even if we have not committed to provide financial support to the investee. Such additional equity method losses, if any, are based upon the change in our claim on the investee's book value.

(g) Receivables

Receivables primarily consist of balances due from customers, insurance premiums receivable and reinsurance losses recoverable. Receivables are stated net of estimated allowances for uncollectible balances. Allowances for uncollectible balances are provided when it is probable counterparties or customers will be unable to pay all amounts due based on the contractual terms. We charge-off receivables against the allowances after all reasonable collection efforts are exhausted.

(h) Loans and finance receivables

Loans and finance receivables are predominantly manufactured housing installment loans. We carry these loans at amortized cost, net of allowances for uncollectible accounts, based on our ability and intent to hold such loans to maturity. Acquisition costs and loan origination and commitment costs paid or fees received along with acquisition premiums or discounts are amortized as yield adjustments over the lives of the loans. Substantially all of our loans and finance receivables are secured by real or personal property or by other assets of the borrower.

Allowances for credit losses on loans include estimates of losses on loans currently in foreclosure and losses on loans not currently in foreclosure. We estimate losses on loans in foreclosure based on historical experience and collateral recovery rates. Estimates of losses on loans not currently in foreclosure consider historical default rates, collateral recovery rates and prevailing economic conditions. Allowances for credit losses also incorporate the historical average time elapsed from the last payment until foreclosure.

Loans are considered delinquent when payments are more than 30 days past due. We place loans over 90 days past due on nonaccrual status and accrued but uncollected interest is reversed. Subsequent collections on the loans are first applied to the principal and interest owed for the most delinquent amount. We resume interest income accrual once a loan is less than 90 days delinquent.

Loans in the foreclosure process are considered non-performing. Once a loan is in foreclosure, interest income is not recognized unless the foreclosure is cured or the loan is modified. Once a modification is complete, interest income is recognized based on the terms of the new loan. Foreclosed loans are charged off when the collateral is sold. Loans not in foreclosure are evaluated for charge-off based on individual circumstances concerning the future collectability of the loan and the condition of the collateral securing the loan.

(i) Derivatives

We carry derivative contracts in our Consolidated Balance Sheets at fair value, net of reductions permitted under master netting agreements with counterparties. We record the changes in fair value of derivative contracts that do not qualify as hedging instruments for financial reporting purposes in earnings or, if such contracts involve our regulated utilities subsidiaries, as regulatory assets or liabilities when inclusion in regulated rates is probable.

(j) Fair value measurements

As defined under GAAP, fair value is the price that would be received to sell an asset or paid to transfer a liability between market participants in the principal market or in the most advantageous market when no principal market exists. Adjustments to transaction prices or quoted market prices may be required in illiquid or disorderly markets in order to estimate fair value. Alternative valuation techniques may be appropriate under the circumstances to determine the value that would be received to sell an asset or paid to transfer a liability in an orderly transaction. Market participants are assumed to be independent, knowledgeable, able and willing to transact an exchange and not acting under duress. Our nonperformance or credit risk is considered in determining the fair value of liabilities. Considerable judgment may be required in interpreting market data used to develop the estimates of fair value. Accordingly, estimates of fair value presented herein are not necessarily indicative of the amounts that could be realized in a current or future market exchange.

(k) Inventories

Inventories consist of manufactured goods, goods acquired for resale, homes constructed for sale, and materials consumed in business operations. Manufactured inventory costs include materials, direct and indirect labor and factory overhead. At December 31, 2019, we used the last-in-first-out ("LIFO") method to value approximately 37% of consolidated inventories with the remainder primarily determined under first-in-first-out and average cost methods. Non-LIFO inventories are stated at the lower of cost or net realizable value. The excess of current or replacement costs over costs determined under LIFO was approximately $950 million as of December 31, 2019 and $1.0 billion as of December 31, 2018.

(l) Property, plant and equipment

We record additions to property, plant and equipment used in operations at cost, which includes asset additions, improvements and betterments. With respect to constructed assets, all materials, direct labor and contract services as well as certain indirect costs are capitalized. Indirect costs include interest over the construction period. With respect to constructed assets of our utility and energy subsidiaries that are subject to authoritative guidance for regulated operations, capitalized costs also include an allowance for funds used during construction, which represents the cost of equity funds used to finance the construction of the regulated facilities. Normal repairs and maintenance and other costs that do not improve the property, extend the useful life or otherwise do not meet capitalization criteria are charged to expense as incurred.

Depreciation of assets of our regulated utilities and railroad is generally determined using group depreciation methods where rates are based on periodic depreciation studies approved by the applicable regulator. Under group depreciation, a composite rate is applied to the gross investment in a particular class of property, despite differences in the service life or salvage value of individual property units within the same class. When such assets are retired or sold, no gain or loss is recognized. Gains or losses on disposals of all other assets are recorded through earnings.

We depreciate property, plant and equipment used by our other businesses to estimated salvage value primarily using the straight-line method over estimated useful lives. Ranges of estimated useful lives of depreciable assets used in our other businesses are as follows: buildings and improvements – 5 to 50 years, machinery and equipment – 3 to 25 years and furniture, fixtures and other – 3 to 15 years. Ranges of estimated useful lives of depreciable assets unique to our railroad business are as follows: track structure and other roadway – 10 to 100 years and locomotives, freight cars and other equipment – 6 to 41 years. Ranges of estimated useful lives of assets unique to our regulated utilities and energy businesses are as follows: utility generation, transmission and distribution systems – 5 to 80 years, interstate natural gas pipeline assets – 3 to 80 years and independent power plants and other assets – 3 to 30 years.

(1) Significant accounting policies and practices *(Continued)*

(l) Property, plant and equipment (Continued)

We evaluate property, plant and equipment for impairment when events or changes in circumstances indicate that the carrying value of such assets may not be recoverable or when the assets are held for sale. Upon the occurrence of a triggering event, we assess whether the estimated undiscounted cash flows expected from the use of the asset and the residual value from the ultimate disposal of the asset exceeds the carrying value. If the carrying value exceeds the estimated recoverable amounts, we reduce the carrying value to fair value and record an impairment loss in earnings, except with respect to impairment of assets of our regulated utility and energy subsidiaries where the impacts of regulation are considered in evaluating the carrying value.

(m) Leases

We are party to contracts where we lease property to others ("lessor" contracts) and where we lease property from others ("lessee" contracts). We record additions to equipment that we lease to others at cost. We depreciate equipment held for lease to estimated salvage value primarily using the straight-line method over estimated useful lives ranging from 5 to 35 years. We use declining balance deprecation methods for assets when the revenue-earning power of the asset is relatively greater during the earlier years of its life and maintenance and repair costs increase during the later years. We also evaluate equipment held for lease for impairment consistent with policies for property, plant and equipment.

When we lease assets from others, we record right-of-use assets and lease liabilities. Right-of-use assets represent our right to use an underlying asset for the lease term and lease liabilities represent our obligation to make lease payments arising from the lease. In this regard, lease payments include fixed payments and variable payments that depend on an index or rate. The lease term is generally the non-cancellable lease period. Certain lease contracts contain renewal options or other terms that provide for variable payments based on performance or usage. Options are not included in determining right-of-use assets or lease liabilities unless it is reasonably certain that options will be exercised. Generally, incremental borrowing rates are used in measuring lease liabilities. Right-of-use assets are subject to review for impairment.

(n) Goodwill and other intangible assets

Goodwill represents the excess of the acquisition price of a business over the fair value of identified net assets of that business. We evaluate goodwill for impairment at least annually. When evaluating goodwill for impairment, we estimate the fair value of the reporting unit. Several methods may be used to estimate a reporting unit's fair value, including market quotations, asset and liability fair values and other valuation techniques, including, but not limited to, discounted projected future net earnings or net cash flows and multiples of earnings.

If the carrying amount of a reporting unit, including goodwill, exceeds the estimated fair value, then the identifiable assets and liabilities of the reporting unit are estimated at fair value as of the current testing date. The excess of the estimated fair value of the reporting unit over the current estimated fair value of net assets establishes the implied value of goodwill. The excess of the recorded goodwill over the implied goodwill value is charged to earnings as an impairment loss.

Intangible assets with indefinite lives are also tested for impairment at least annually and when events or changes in circumstances indicate that, more-likely-than-not, the asset is impaired. Significant judgment is required in estimating fair values and performing goodwill and indefinite-life intangible asset impairment tests. We amortize intangible assets with finite lives in a pattern that reflects the expected consumption of related economic benefits or on a straight-line basis over the estimated economic useful lives. Intangible assets with finite lives are reviewed for impairment when events or changes in circumstances indicate that the carrying amount may not be recoverable.

(1) Significant accounting policies and practices *(Continued)*

(o) Revenue recognition

We earn insurance premiums on prospective property/casualty insurance and reinsurance contracts over the loss exposure or coverage period in proportion to the level of protection provided. In most cases, such premiums are earned ratably over the term of the contract with unearned premiums computed on a monthly or daily pro-rata basis. Premiums on retroactive property/casualty reinsurance contracts are earned at the inception of the contracts, as all of the underlying loss events covered by the policies occurred prior to contract inception. Premiums for life reinsurance and annuity contracts are earned when due. Premiums earned are stated net of amounts ceded to reinsurers. Premiums earned on contracts with experience-rating provisions reflect estimated loss experience under such contracts.

On January 1, 2018, we adopted Accounting Standards Codification ("ASC") 606 "Revenues from Contracts with Customers." Except as described in Note 1(x), our revenue recognition practices for contracts with customers under ASC 606 do not differ significantly from prior practices. Under ASC 606, revenues are recognized when a good or service is transferred to a customer. A good or service is transferred when (or as) the customer obtains control of that good or service. Revenues are based on the consideration we expect to receive in connection with our promises to deliver goods and services to our customers.

We manufacture and/or distribute a wide variety of industrial, building and consumer products. Our sales contracts provide customers with these products through wholesale and retail channels in exchange for consideration specified under the contracts. Contracts generally represent customer orders for individual products at stated prices. Sales contracts may contain either single or multiple performance obligations. In instances where contracts contain multiple performance obligations, we allocate the revenue to each obligation based on the relative stand-alone selling prices of each product or service.

Sales revenue reflects reductions for returns, allowances, volume discounts and other incentives, some of which may be contingent on future events. In certain customer contracts, sales revenue includes certain state and local excise taxes billed to customers on specified products when those taxes are levied directly upon us by the taxing authorities. Sales revenue excludes sales taxes and value-added taxes collected on behalf of taxing authorities. Sales revenue includes consideration for shipping and other fulfillment activities performed prior to the customer obtaining control of the goods. We also elect to treat consideration for such services performed after control has passed to the customer as sales revenue.

Our product sales revenues are generally recognized at a point in time when control of the product transfers to the customer, which coincides with customer pickup or product delivery or acceptance, depending on terms of the arrangement. We recognize sales revenues and related costs with respect to certain contracts over time, primarily from certain castings, forgings and aerostructures contracts. Control of the product units under these contracts transfers continuously to the customer as the product is manufactured. These products generally have no alternative use and the contract requires the customer to provide reasonable compensation if terminated for reasons other than breach of contract.

Our energy revenue derives primarily from tariff based sales arrangements approved by various regulatory commissions. These tariff based revenues are mainly comprised of energy, transmission, distribution and natural gas and have performance obligations to deliver energy products and services to customers which are satisfied over time as energy is delivered or services are provided. Our nonregulated energy revenue primarily relates to our renewable energy business. Energy revenues are equivalent to the amounts we have the right to invoice and correspond directly with the value to the customer of the performance to date and include billed and unbilled amounts. Payments from customers are generally due from the customer within 30 days of billing. Rates charged for energy products and services are established by regulators or contractual arrangements that establish the transaction price, as well as the allocation of price among the separate performance obligations. When preliminary regulated rates are permitted to be billed prior to final approval by the applicable regulator, certain revenue collected may be subject to refund and a liability for estimated refunds is accrued.

(1) Significant accounting policies and practices *(Continued)*

(o) Revenue recognition (Continued)

The primary performance obligation under our freight rail transportation service contracts is to move freight from a point of origin to a point of destination. The performance obligations are represented by bills of lading which create a series of distinct services that have a similar pattern of transfer to the customer. The revenues for each performance obligation are based on various factors including the product being shipped, the origin and destination pair, and contract incentives which are outlined in various private rate agreements, common carrier public tariffs, interline foreign road agreements and pricing quotes. The transaction price is generally a per car amount to transport railcars from a specified origin to a specified destination. Freight revenues are recognized over time as the service is performed because the customer simultaneously receives and consumes the benefits of the service. Revenues recognized represent the proportion of the service completed as of the balance sheet date. Invoices for freight transportation services are generally issued to customers and paid within 30 days or less. Customer incentives, which are primarily provided for shipping a specified cumulative volume or shipping to/from specific locations, are recorded as a reduction to revenue on a pro-rata basis based on actual or projected future customer shipments.

Other service revenues derive from contracts with customers in which performance obligations are satisfied over time, where customers receive and consume benefits as we perform the services, or at a point in time when the services are provided. Other service revenues primarily derive from real estate brokerage, automotive repair, aircraft management, aviation training, franchising and news distribution services.

Leasing revenue is generally recognized ratably over the term of the lease or based on usage, if applicable under the terms of the contract. A substantial portion of our leases are classified as operating leases. Prior to January 1, 2018, we recognized revenues from the sales of fractional ownership interests in aircraft over the term of the related management services agreements, as the transfers of the ownership interests were inseparable from the management services agreements. These agreements also include provisions that require us to repurchase the fractional interest at fair market value at contract termination or upon the customer's request following the end of a minimum commitment period. ASC 606 provides that such contracts are subject to accounting guidance for lease contracts and not ASC 606. The re-characterization of these fractional ownership interests as operating leases did not have a significant effect on our consolidated revenues or earnings.

(p) Losses and loss adjustment expenses

We record liabilities for unpaid losses and loss adjustment expenses assumed under property/casualty insurance and reinsurance contracts for loss events that have occurred on or before the balance sheet date. Such liabilities represent the estimated ultimate payment amounts without discounting for time value.

We base liability estimates on (1) reports of losses from policyholders, (2) individual case estimates and (3) estimates of incurred but not reported losses. Losses and loss adjustment expenses in the Consolidated Statements of Earnings include paid claims, claim settlement costs and changes in estimated claim liabilities. Losses and loss adjustment expenses charged to earnings are net of amounts recovered and estimates of amounts recoverable under ceded reinsurance contracts. Reinsurance contracts do not relieve the ceding company of its obligations to indemnify policyholders with respect to the underlying insurance and reinsurance contracts.

(q) Retroactive reinsurance contracts

We record liabilities for unpaid losses and loss adjustment expenses assumed under retroactive reinsurance of short duration contracts consistent with other short duration property/casualty insurance and reinsurance contracts discussed in Note 1(p). With respect to retroactive reinsurance contracts, we also record deferred charge assets at the inception of the contracts, representing the excess, if any, of the estimated ultimate claim liabilities over the premiums earned. We subsequently amortize the deferred charge assets over the expected claim settlement periods using the interest method. Changes to the estimated timing or amount of future loss payments also produce changes in deferred charge balances. We apply changes in such estimates retrospectively and the resulting changes in deferred charge balances, together with periodic amortization, are included in insurance losses and loss adjustment expenses in the Consolidated Statements of Earnings.

(1) Significant accounting policies and practices *(Continued)*

(r) Insurance policy acquisition costs

We capitalize the incremental costs that directly relate to the successful sale of insurance contracts, subject to ultimate recoverability, and we subsequently amortize such costs to underwriting expenses as the related premiums are earned. Direct incremental acquisition costs include commissions, premium taxes and certain other costs associated with successful efforts. We expense all other underwriting costs as incurred. The recoverability of capitalized insurance policy acquisition costs generally reflects anticipation of investment income. The unamortized balances are included in other assets and were $2,937 million and $2,658 million at December 31, 2019 and 2018, respectively.

(s) Life and annuity insurance benefits

We compute our liabilities for insurance benefits under life contracts based upon estimated future investment yields, expected mortality, morbidity, and lapse or withdrawal rates as well as estimates of premiums we expect to receive and expenses we expect to incur in the future. These assumptions, as applicable, also include a margin for adverse deviation and may vary with the characteristics of the contract's date of issuance, policy duration and country of risk. The interest rate assumptions used may vary by contract or jurisdiction. We discount periodic payment annuity liabilities based on the implicit rate as of the inception of the contracts such that the present value of the liabilities equals the premiums. Discount rates generally range from 3% to 7.5%.

(t) Regulated utilities and energy businesses

Certain energy subsidiaries prepare their financial statements in accordance with authoritative guidance for regulated operations, reflecting the economic effects of regulation from the ability to recover certain costs from customers and the requirement to return revenues to customers in the future through the regulated rate-setting process. Accordingly, certain costs are deferred as regulatory assets and certain income is accrued as regulatory liabilities. Regulatory assets and liabilities will be amortized into operating expenses and revenues over various future periods.

Regulatory assets and liabilities are continually assessed for probable future inclusion in regulatory rates by considering factors such as applicable regulatory or legislative changes and recent rate orders received by other regulated entities. If future inclusion in regulatory rates ceases to be probable, the amount no longer probable of inclusion in regulatory rates is charged or credited to earnings (or other comprehensive income, if applicable) or returned to customers.

(u) Foreign currency

The accounts of our non-U.S. based subsidiaries are measured, in most instances, using functional currencies other than the U.S. Dollar. Revenues and expenses of these subsidiaries are translated into U.S. Dollars at the average exchange rate for the period and assets and liabilities are translated at the exchange rate as of the end of the reporting period. Gains or losses from translating the financial statements of these subsidiaries are included in shareholders' equity as a component of accumulated other comprehensive income. Gains and losses arising from transactions denominated in a currency other than the functional currency of the reporting entity, including gains and losses from the remeasurement of assets and liabilities due to changes in currency exchange rates, are included in earnings.

(v) Income taxes

Berkshire files a consolidated federal income tax return in the United States, which includes eligible subsidiaries. In addition, we file income tax returns in state, local and foreign jurisdictions as applicable. Provisions for current income tax liabilities are calculated and accrued on income and expense amounts expected to be included in the income tax returns for the current year. Income taxes reported in earnings also include deferred income tax provisions.

Deferred income tax assets and liabilities are computed on differences between the financial statement bases and tax bases of assets and liabilities at the enacted tax rates. Changes in deferred income tax assets and liabilities associated with components of other comprehensive income are charged or credited directly to other comprehensive income. Otherwise, changes in deferred income tax assets and liabilities are included as a component of income tax expense. The effect on deferred income tax assets and liabilities attributable to changes in enacted tax rates are charged or credited to income tax expense in the period of enactment. Valuation allowances are established for certain deferred tax assets when realization is not likely.

(1) Significant accounting policies and practices *(Continued)*

(v) Income taxes (Continued)

Assets and liabilities are established for uncertain tax positions taken or positions expected to be taken in income tax returns when such positions, in our judgment, do not meet a more-likely-than-not threshold based on the technical merits of the positions. Estimated interest and penalties related to uncertain tax positions are included as a component of income tax expense.

(w) New accounting pronouncements adopted in 2019

Berkshire adopted ASC 842 "Leases" on January 1, 2019. Most significantly, ASC 842 requires a lessee to recognize a liability to make operating lease payments and an asset with respect to its right to use the underlying asset for the lease term. In adopting and applying ASC 842, we elected to use practical expedients, including but not limited to, not reassessing past lease and easement accounting, not separating lease components from non-lease components by class of asset and not recording assets or liabilities for leases with terms of one year or less. We adopted ASC 842 as of January 1, 2019 with regard to contracts in effect as of that date and elected to not restate prior period financial statements.

Upon the adoption of ASC 842, we recognized operating lease right-of-use assets of approximately $6.2 billion and lease liabilities of $5.9 billion. We also reduced other assets by approximately $300 million. Consequently, our consolidated assets and liabilities increased by approximately $5.9 billion. ASC 842 did not have a material effect on our accounting for our lessor contracts or for lessee contracts classified as financing leases.

(x) New accounting pronouncements adopted in 2018

On January 1, 2018, we adopted Accounting Standards Update ("ASU") 2016-01 "Financial Instruments —Recognition and Measurement of Financial Assets and Financial Liabilities," ASU 2018-02 "Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income" and ASC 606 "Revenues from Contracts with Customers." Prior year financial statements were not restated. A summary of the effects of the initial adoption of ASU 2016-01, ASU 2018-02 and ASC 606 on our shareholders' equity follows (in millions).

	ASU 2016-01	ASU 2018-02	ASC 606	Total
Increase (decrease):				
Accumulated other comprehensive income	$ (61,459)	$ 84	$ —	$ (61,375)
Retained earnings	61,459	(84)	(70)	61,305
Shareholders' equity	—	—	(70)	(70)

With respect to ASU 2016-01, beginning in 2018, unrealized gains and losses from the changes in the fair values of our equity securities during the period are included within investment gains/losses in the Consolidated Statements of Earnings. As of January 1, 2018, we reclassified net after-tax unrealized gains on equity securities from accumulated other comprehensive income to retained earnings. In adopting ASU 2018-02, we reclassified the stranded deferred income tax effects arising from the reduction in the U.S. statutory income tax rate under the Tax Cuts and Jobs Act of 2017 that were included in accumulated other comprehensive income as of January 1, 2018 to retained earnings.

In adopting ASC 606, we recorded increases to certain assets and other liabilities, with the cumulative net effect recorded to retained earnings. Prior to January 1, 2018, we recognized revenues from the sales of fractional ownership interests in aircraft over the term of the related management services agreements. As discussed in Note 1(o), ASC 606 provides that such contracts are subject to accounting guidance for lease contracts. The principal effects of this re-characterization were to increase equipment held for lease and aircraft repurchase liabilities and unearned lease revenues by approximately $3.5 billion.

(1) Significant accounting policies and practices *(Continued)*

(y) New accounting pronouncements to be adopted subsequent to December 31, 2019

In June 2016, the Financial Accounting Standards Board ("FASB") issued ASU 2016-13, which together with subsequent FASB amendments, were codified in ASC 326 "Financial Instruments—Credit Losses." ASC 326 provides for the recognition and measurement at the reporting date of expected credit losses for financial assets held at amortized cost. ASC 326 also modifies impairment loss recognition measurement for available-for-sale debt securities. Under existing accounting principles, credit losses are recognized and measured when such losses become probable based on the prevailing facts and circumstances. ASC 326 is effective for reporting periods beginning after December 15, 2019. We are adopting ASC 326 as of January 1, 2020 and do not expect its adoption will have a material effect on our Consolidated Financial Statements.

In January 2017, the FASB issued ASU 2017-04 "Simplifying the Test for Goodwill Impairment." ASU 2017-04 eliminates the requirement to determine the implied value of goodwill in measuring an impairment loss. Upon adoption of ASU 2017-04, the measurement of a goodwill impairment will represent the excess of the reporting unit's carrying value over its fair value and will be limited to the carrying value of goodwill. ASU 2017-04 is effective for goodwill impairment tests in fiscal years beginning after December 15, 2019, and we are adopting ASU 2017-14 as of January 1, 2020.

In August 2018, the FASB issued ASU 2018-12 "Targeted Improvements to the Accounting for Long-Duration Contracts." ASU 2018-12 requires periodic reassessment of actuarial and discount rate assumptions used to value policyholder liabilities and deferred acquisition costs arising from the issuance of long-duration insurance and reinsurance contracts, with the effects of changes in cash flow assumptions reflected in earnings and the effects of changes in discount rate assumptions reflected in other comprehensive income. Currently, the actuarial and discount rate assumptions are set at the contract inception date and not subsequently changed, except under limited circumstances. ASU 2018-12 requires new disclosures and is effective for fiscal years beginning after December 15, 2021, with early adoption permitted. We are evaluating the effect this standard will have on our Consolidated Financial Statements.

(2) Business acquisitions

Our long-held acquisition strategy is to acquire businesses that have consistent earning power, good returns on equity and able and honest management. Financial results attributable to business acquisitions are included in our Consolidated Financial Statements beginning on their respective acquisition dates.

On October 1, 2018, we acquired Medical Liability Mutual Insurance Company ("Medical Liability Mutual"), a writer of medical professional liability insurance domiciled in New York. At that time, Medical Liability Mutual's name was changed to MLMIC Insurance Company ("MLMIC"). The acquisition price was approximately \$2.5 billion. As of the acquisition date, the fair value of MLMIC's assets was approximately \$6.1 billion, including cash (\$230 million) and investments (\$5.2 billion), and the fair value of its liabilities was approximately \$3.6 billion, consisting primarily of unpaid losses and loss adjustment expenses (\$3.2 billion).

In each of the past three years, we also completed several smaller-sized business acquisitions, which we consider as "bolt-ons" to several of our existing business operations. Aggregate consideration paid for bolt-on acquisitions, net of cash acquired was approximately \$1.7 billion in 2019, \$1.0 billion in 2018 and \$2.7 billion in 2017. We do not believe that these acquisitions are material, individually or in the aggregate to our Consolidated Financial Statements.

(3) Investments in fixed maturity securities

Investments in fixed maturity securities as of December 31, 2019 and 2018 are summarized by type below (in millions).

	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
December 31, 2019				
U.S. Treasury, U.S. government corporations and agencies	$ 3,054	$ 37	$ (1)	$ 3,090
Foreign governments	8,584	63	(9)	8,638
Corporate bonds	5,896	459	(3)	6,352
Other	539	67	(1)	605
	$ 18,073	$ 626	$ (14)	$ 18,685
December 31, 2018				
U.S. Treasury, U.S. government corporations and agencies	$ 4,223	$ 22	$ (22)	$ 4,223
Foreign governments	7,480	50	(28)	7,502
Corporate bonds	7,055	408	(23)	7,440
Other	669	66	(2)	733
	$ 19,427	$ 546	$ (75)	$ 19,898

Investments in foreign governments include securities issued by national and provincial government entities as well as instruments that are unconditionally guaranteed by such entities. As of December 31, 2019, approximately 87% of our foreign government holdings were rated AA or higher by at least one of the major rating agencies.

The amortized cost and estimated fair value of fixed maturity securities at December 31, 2019 are summarized below by contractual maturity dates. Amounts are in millions. Actual maturities may differ from contractual maturities due to early call or prepayment rights held by issuers.

	Due in one year or less	Due after one year through five years	Due after five years through ten years	Due after ten years	Mortgage-backed securities	Total
Amortized cost	$ 6,732	$ 10,203	$ 311	$ 428	$ 399	$18,073
Fair value	6,761	10,321	355	789	459	18,685

(4) Investments in equity securities

Investments in equity securities as of December 31, 2019 and 2018 are summarized based on the primary industry of the investee in the table below (in millions).

	Cost Basis	Net Unrealized Gains	Fair Value
*December 31, 2019 **			
Banks, insurance and finance	$ 40,419	$ 61,976	$ 102,395
Consumer products	38,887	60,747	99,634
Commercial, industrial and other	31,034	14,964	45,998
	$ 110,340	$ 137,687	$ 248,027

* *Approximately 67% of the aggregate fair value was concentrated in five companies (American Express Company – $18.9 billion; Apple Inc. – $73.7 billion; Bank of America Corporation – $33.4 billion; The Coca-Cola Company – $22.1 billion and Wells Fargo & Company – $18.6 billion).*

	Cost Basis	Net Unrealized Gains	Fair Value
*December 31, 2018 **			
Banks, insurance and finance	$ 44,332	$ 38,260	$ 82,592
Consumer products	38,783	22,838	61,621
Commercial, industrial and other	19,752	8,792	28,544
	$ 102,867	$ 69,890	$ 172,757

* *Approximately 68% of the aggregate fair value was concentrated in five companies (American Express Company – $14.5 billion; Apple Inc. – $40.3 billion; Bank of America Corporation – $22.6 billion; The Coca-Cola Company – $18.9 billion and Wells Fargo & Company – $20.7 billion).*

On April 30, 2019, Berkshire committed to invest a total of $10 billion in connection with Occidental Petroleum Corporation's ("Occidental") proposal to acquire Anadarko Petroleum Corporation ("Anadarko"). The Anadarko shareholders approved the acquisition by Occidental on August 8, 2019 and the acquisition and our investment in Occidental closed on August 8, 2019. Our investments in Occidental are included in the commercial, industrial and other category in the preceding table.

Berkshire's investments in Occidental include newly issued Occidental Cumulative Perpetual Preferred Stock with an aggregate liquidation value of $10 billion, together with warrants to purchase up to 80 million shares of Occidental common stock at an exercise price of $62.50 per share. The preferred stock accrues dividends at 8% per annum and is redeemable at the option of Occidental commencing on the tenth anniversary of issuance at a redemption price equal to 105% of the liquidation preference plus any accumulated and unpaid dividends, or mandatorily under certain specified capital return events. Dividends on the preferred stock may be paid in cash or, at Occidental's option, in shares of Occidental common stock. The warrants are exercisable in whole or in part until one year after the redemption of the preferred stock.

(5) Equity method investments

Berkshire and its subsidiaries hold investments in certain businesses that are accounted for pursuant to the equity method. Currently, the most significant of these is our investment in the common stock of The Kraft Heinz Company ("Kraft Heinz"). Kraft Heinz is one of the world's largest manufacturers and marketers of food and beverage products, including condiments and sauces, cheese and dairy, meals, meats, refreshment beverages, coffee and other grocery products. Berkshire currently owns 325,442,152 shares of Kraft Heinz common stock representing 26.6% of the outstanding shares.

Notes to Consolidated Financial Statements *(Continued)*

(5) Equity method investments *(Continued)*

Shares of Kraft Heinz common stock are publicly-traded and the fair value of our investment at December 31, 2019 and 2018 was approximately $10.5 billion and $14.0 billion, respectively. The carrying value of our investment at both December 31, 2019 and 2018 was approximately $13.8 billion. We recorded equity method earnings of $493 million in 2019, losses of approximately $2.7 billion in 2018, and earnings of approximately $2.9 billion in 2017. In 2019 and 2018, our equity method earnings/losses included our share of the after-tax intangible asset impairment losses recorded by Kraft Heinz. Kraft Heinz recorded pre-tax impairment losses of approximately $1.9 billion in 2019 and $15.9 billion in 2018. In 2017, our equity method earnings included our share of certain one-time effects of the Tax Cuts and Jobs Act of 2017 on Kraft Heinz's net earnings. We received dividends on the common stock of $521 million in 2019, $814 million in 2018 and $797 million in 2017, which we recorded as reductions in our carrying value.

As of December 31, 2019, the carrying value of our investment in Kraft Heinz exceeded the fair value based on the quoted market price by $3.3 billion (24%). In light of that fact, we evaluated our investment in Kraft Heinz for impairment. We utilize no bright-line tests in such evaluations. Based on the available facts and information regarding the operating results of Kraft Heinz, our ability and intent to hold the investment until recovery, the relative amount of the decline, and the length of time that fair value was less than carrying value, we concluded that recognition of an impairment loss in earnings was not required. However, we will continue to monitor this investment and it is possible that an impairment loss will be recorded in earnings in a future period based on changes in facts and circumstances or intentions.

Summarized financial information of Kraft Heinz follows (in millions).

	December 28, 2019	December 29, 2018
Assets	$ 101,450	$ 103,461
Liabilities	49,701	51,683

	Year ending December 28, 2019	Year ending December 29, 2018	Year ending December 30, 2017
Sales	$ 24,977	$ 26,268	$ 26,076
Net earnings (losses) attributable to Kraft Heinz common shareholders	$ 1,935	$ (10,192)	$ 10,941

Other investments accounted for pursuant to the equity method include our investments in Berkadia Commercial Mortgage LLC ("Berkadia"), Pilot Travel Centers LLC ("Pilot") and Electric Transmission Texas, LLC ("ETT"). The carrying value of our investments in these entities was approximately $3.7 billion as of December 31, 2019 and $3.5 billion as of December 31, 2018. Our equity method earnings in these entities were $683 million in 2019, $563 million in 2018 and $76 million in 2017. Additional information concerning these investments follows.

We own a 50% interest in Berkadia, with Jefferies Financial Group Inc. ("Jefferies") owning the other 50% interest. Berkadia is a servicer of commercial real estate loans in the U.S., performing primary, master and special servicing functions for U.S. government agency programs, commercial mortgage-backed securities transactions, banks, insurance companies and other financial institutions. A source of funding for Berkadia's operations is through its issuance of commercial paper, which is currently limited to $1.5 billion. On December 31, 2019, Berkadia's commercial paper outstanding was $1.47 billion. The commercial paper is supported by a surety policy issued by a Berkshire insurance subsidiary. Jefferies is obligated to indemnify us for one-half of any losses incurred under the policy. In addition, a Berkshire Hathaway Energy Company subsidiary owns a 50% interest in ETT, an owner and operator of electric transmission assets in the Electric Reliability Council of Texas footprint. American Electric Power owns the other 50% interest.

On October 3, 2017, we entered into an investment agreement and an equity purchase agreement whereby we acquired a 38.6% interest in Pilot, headquartered in Knoxville, Tennessee. Pilot is one of the largest operators of travel centers in North America, with more than 28,000 team members, 750 locations across the U.S. and Canada, and more than $30 billion in annual revenues. The Haslam family currently owns a 50.1% interest in Pilot and a third party owns the remaining 11.3% interest. We also entered into an agreement to acquire in 2023 an additional 41.4% interest in Pilot with the Haslam family retaining a 20% interest. As a result, Berkshire will become the majority owner of Pilot in 2023.

(6) Investment gains/losses

Investment gains/losses for each of the three years ending December 31, 2019 are summarized below (in millions).

	2019	2018	2017
Equity securities:			
Unrealized investment gains/losses on securities held at the end of the period	$ 69,581	$ (22,729)	$ —
Investment gains/losses during the year on securities sold	1,585	291	—
Gross realized gains	—	—	2,237
Gross realized losses	—	—	(919)
	71,166	(22,438)	1,318
Fixed maturity securities:			
Gross realized gains	87	480	103
Gross realized losses	(25)	(227)	(22)
Other	(105)	30	11
	$ 71,123	$ (22,155)	$ 1,410

Prior to 2018, we recognized investment gains and losses in earnings when we sold or otherwise disposed of equity securities based on the difference between the proceeds from the sale and the cost of the securities and also when we recognized other-than-temporary impairment losses. Beginning in 2018, investment gains and losses included in earnings also include unrealized gains and losses from changes in fair values during the period on equity securities we still own. Prior to 2018, we recorded the changes in unrealized gains and losses on our investments in equity securities in other comprehensive income.

As reflected in the Consolidated Statements of Cash Flows, we received proceeds of approximately $14.3 billion in 2019 and $18.8 billion in 2018 from sales of equity securities. In the preceding table, investment gains/losses on equity securities sold during 2019 and 2018 reflect the difference between proceeds from sales and the fair value of the equity security sold at the beginning of the period or the purchase date, if later. Our taxable gains on equity securities sold during the year, which are generally the difference between the proceeds from sales and our original cost, were $3.2 billion in 2019 and $3.3 billion in 2018.

(7) Loans and finance receivables

Loans and finance receivables are summarized as follows (in millions).

	December 31,	
	2019	2018
Loans and finance receivables before allowances and discounts	$ 18,199	$ 16,962
Allowances for uncollectible loans	(167)	(177)
Unamortized acquisition discounts and points	(505)	(505)
	$ 17,527	$ 16,280

Loans and finance receivables are predominantly installment loans originated or acquired by our manufactured housing business. Provisions for loan losses for 2019 and 2018 were $125 million and $141 million, respectively. Loan charge-offs, net of recoveries, were $135 million in 2019 and $144 million in 2018. At December 31, 2019, approximately 98% of the manufactured housing loan balances were evaluated collectively for impairment, with the remainder evaluated individually. As part of the evaluation process, credit quality indicators are reviewed and loans are designated as performing or non-performing. At December 31, 2019, we considered approximately 99% of the loan balances to be performing and approximately 96% of the loan balances to be current as to payment status.

Additionally, in 2018, we entered into an agreement with Seritage Growth Properties to provide a $2.0 billion term loan facility, which matures on July 31, 2023. As of December 31, 2019, the outstanding loans under the facility were approximately $1.6 billion.

(8) Other receivables

Other receivables of insurance and other businesses are comprised of the following (in millions).

	December 31, 2019	December 31, 2018
Insurance premiums receivable	$ 13,379	$ 12,452
Reinsurance recoverable on unpaid losses	2,855	3,060
Trade receivables	12,275	12,617
Other	4,327	3,823
Allowances for uncollectible accounts	(418)	(388)
	$ 32,418	$ 31,564

Receivables of our railroad and our utilities and energy businesses are comprised of the following (in millions).

	December 31, 2019	December 31, 2018
Trade receivables	$ 3,120	$ 3,433
Other	388	362
Allowances for uncollectible accounts	(91)	(129)
	$ 3,417	$ 3,666

Trade receivables include unbilled revenue of $638 million and $554 million as of December 31, 2019 and 2018, respectively, attributable to the regulated utility businesses.

(9) Inventories

Inventories are comprised of the following (in millions).

	December 31, 2019	December 31, 2018
Raw materials	$ 4,492	$ 4,182
Work in process and other	2,700	2,625
Finished manufactured goods	4,821	4,541
Goods acquired for resale	7,839	7,721
	$ 19,852	$ 19,069

(10) Property, plant and equipment

A summary of property, plant and equipment of our insurance and other businesses follows (in millions).

	December 31, 2019	December 31, 2018
Land	$ 2,540	$ 2,536
Buildings and improvements	10,719	9,959
Machinery and equipment	24,285	22,574
Furniture, fixtures and other	4,666	4,758
	42,210	39,827
Accumulated depreciation	(20,772)	(19,199)
	$ 21,438	$ 20,628

(10) Property, plant and equipment *(Continued)*

A summary of property, plant and equipment of our railroad and our utilities and energy businesses follows (in millions). The utility generation, transmission and distribution systems and interstate natural gas pipeline assets are owned by regulated public utility and natural gas pipeline subsidiaries.

	December 31, 2019	December 31, 2018
Railroad:		
Land, track structure and other roadway	$ 62,404	$ 59,509
Locomotives, freight cars and other equipment	13,482	13,016
Construction in progress	748	664
	76,634	73,189
Accumulated depreciation	(12,101)	(10,004)
	64,533	63,185
Utilities and energy:		
Utility generation, transmission and distribution systems	81,127	77,288
Interstate natural gas pipeline assets	8,165	7,524
Independent power plants and other assets	8,817	8,324
Construction in progress	3,732	3,110
	101,841	96,246
Accumulated depreciation	(28,536)	(27,651)
	73,305	68,595
	$ 137,838	$ 131,780

Depreciation expense for each of the three years ending December 31, 2019 is summarized below (in millions).

	2019	2018	2017
Insurance and other	$ 2,269	$ 2,186	$ 2,116
Railroad, utilities and energy	5,297	5,098	4,852
	$ 7,566	$ 7,284	$ 6,968

(11) Equipment held for lease

Equipment held for lease includes railcars, aircraft, over-the-road trailers, intermodal tank containers, cranes, storage units and furniture. Equipment held for lease is summarized below (in millions).

	December 31, 2019	December 31, 2018
Railcars	$ 9,260	$ 8,862
Aircraft	8,093	7,376
Other	4,862	4,379
	22,215	20,617
Accumulated depreciation	(7,150)	(6,319)
	$ 15,065	$ 14,298

Depreciation expense for equipment held for lease was $1,181 million in 2019, $1,102 million in 2018 and $751 million in 2017. Operating lease revenues in 2019 were $5,856 million consisting of $4,415 million of fixed lease revenue and $1,441 million of variable lease revenue.

(11) Equipment held for lease *(Continued)*

Operating lease revenues were $5,732 million in 2018 and $2,452 million in 2017. In 2018, due to the adoption of ASC 606, $3,280 million was recorded as operating lease revenues that in previous years would have been recorded as sales and service revenues.

A summary of our remaining operating lease receipts as of December 31, 2019 follows (in millions).

2020	2021	2022	2023	2024	Thereafter	Total
$ 2,623	$ 1,914	$ 1,367	$ 889	$ 468	$ 439	$ 7,700

(12) Leases

We are party to contracts where we lease property from others. As a lessee, we primarily lease office and operating facilities, locomotives, freight cars, energy generation facilities and transmission assets. Operating lease right-of-use assets were $5,941 million and lease liabilities were $5,882 million at December 31, 2019. Such amounts were included in other assets and accounts payable, accruals and other liabilities in our Consolidated Balance Sheet. The weighted average term of these leases was approximately 7.7 years and the weighted average discount rate used to measure lease liabilities was approximately 3.8%. A summary of our remaining operating lease payments as of December 31, 2019 and December 31, 2018 follows (in millions).

	Year 1	Year 2	Year 3	Year 4	Year 5	Thereafter	Total lease payments	Amount representing interest	Lease liabilities
December 31:									
2019	$ 1,374	$ 1,183	$ 950	$ 764	$ 620	$ 1,988	$ 6,879	$ (997)	$ 5,882
2018	1,310	1,268	1,048	820	658	2,079	7,183		

Components of operating lease costs in 2019 by type were as follows (in millions).

Operating lease cost	Short-term lease cost	Variable lease cost	Sublease income	Total lease cost
$ 1,459	$ 178	$ 276	$ (24)	$ 1,889

Operating lease expense was $1,649 million in 2018 and $1,579 million in 2017.

(13) Goodwill and other intangible assets

Reconciliations of the changes in the carrying value of goodwill during 2019 and 2018 follows (in millions).

	December 31, 2019	December 31, 2018
Balance at beginning of year	$ 81,025	$ 81,258
Acquisitions of businesses	890	376
Other, including foreign currency translation	(33)	(609)
Balance at end of year	$ 81,882	$ 81,025

(13) Goodwill and other intangible assets *(Continued)*

Our other intangible assets and related accumulated amortization are summarized as follows (in millions).

	December 31, 2019		December 31, 2018	
	Gross carrying amount	Accumulated amortization	Gross carrying amount	Accumulated amortization
Insurance and other:				
Trademarks and trade names	$ 5,286	$ 759	$ 5,152	$ 727
Patents and technology	4,560	3,032	4,446	2,790
Customer relationships	27,943	5,025	27,697	4,287
Other	3,364	1,286	3,198	1,190
	$ 41,153	$ 10,102	$ 40,493	$ 8,994
Railroad, utilities and energy:				
Trademarks and trade names	$ 212	$ 26	$ 216	$ 23
Customer relationships	678	324	678	286
Other	113	58	117	53
	$ 1,003	$ 408	$ 1,011	$ 362

Intangible asset amortization expense was $1,317 million in 2019, $1,393 million in 2018 and $1,469 million in 2017. Estimated amortization expense over the next five years is as follows (in millions): 2020 – $1,275; 2021 – $1,144; 2022 – $1,082; 2023 – $993 and 2024 – $913. Intangible assets with indefinite lives were $19.0 billion as of December 31, 2019 and $18.9 billion as of December 31, 2018 and primarily related to certain customer relationships and trademarks and trade names.

(14) Derivative contracts

We are party to derivative contracts through certain of our subsidiaries. Currently, the most significant derivative contracts consist of equity index put option contracts. The liabilities and related notional values of these contracts follows (in millions).

	Liabilities	Notional Value
December 31, 2019	$ 968	$ 14,385
December 31, 2018	2,452	26,759

Notional value represents the aggregate undiscounted amounts payable assuming that the value of each index is zero at each contract's expiration date. Certain of these contracts are denominated in foreign currencies. Notional amounts are based on the foreign currency exchange rates as of each balance sheet date.

We recorded derivative contract gains of $1,484 million in 2019, losses of $300 million in 2018 and gains of $718 million in 2017, with respect to our equity index put option contracts. The gains in 2019 were primarily due to increases in equity index values.

The equity index put option contracts are European style options written prior to March 2008 on four major equity indexes. During 2019, contracts with notional values of approximately $12.3 billion expired and substantially all of the remaining contracts will expire by February 2023. At December 31, 2019, the remaining weighted average life of all contracts was approximately 1.8 years. We received aggregate premiums of $2.5 billion on the remaining contracts at the contract inception dates and we have no counterparty credit risk. Future payments, if any, under any given contract will be required if the prevailing index value is below the contract strike price at the expiration date. The aggregate intrinsic value (the undiscounted liability assuming the contracts are settled based on the index values and foreign currency exchange rates as of the balance sheet date) was $397 million at December 31, 2019 and $1,653 million at December 31, 2018. These contracts may not be unilaterally terminated or fully settled before the expiration dates and the ultimate amount of cash basis gains or losses on these contracts will not be determined until the contract expiration dates.

(14) Derivative contracts *(Continued)*

Our regulated utility subsidiaries may use forward purchases and sales, futures, swaps and options to manage a portion of their commodity price risks. Most of these net derivative contract assets or liabilities of our regulated utilities are probable of recovery through rates and are offset by regulatory liabilities or assets. Derivative contract assets were $145 million and $172 million at December 31, 2019 and 2018, respectively. Derivative contract liabilities were $76 million and $111 million at December 31, 2019 and 2018, respectively.

(15) Unpaid losses and loss adjustment expenses

Our liabilities for unpaid losses and loss adjustment expenses (also referred to as "claim liabilities") under property and casualty insurance and reinsurance contracts are based upon estimates of the ultimate claim costs associated with claim occurrences as of the balance sheet date and include estimates for incurred-but-not-reported ("IBNR") claims. A reconciliation of the changes in claim liabilities, excluding liabilities under retroactive reinsurance contracts (see Note 16), for each of the three years ending December 31, 2019 is as follows (in millions).

	2019	2018	2017
Balances – beginning of year:			
Gross liabilities	$ 68,458	$ 61,122	$ 53,379
Reinsurance recoverable on unpaid losses	(3,060)	(3,201)	(3,338)
Net liabilities	65,398	57,921	50,041
Incurred losses and loss adjustment expenses:			
Current accident year events	43,335	39,876	37,702
Prior accident years' events	(752)	(1,406)	(544)
Total incurred losses and loss adjustment expenses	42,583	38,470	37,158
Paid losses and loss adjustment expenses:			
Current accident year events	(19,482)	(18,391)	(17,425)
Prior accident years' events	(17,642)	(15,452)	(12,507)
Total payments	(37,124)	(33,843)	(29,932)
Foreign currency translation adjustment	(23)	(331)	654
Business acquisition (disposition)	(670)	3,181	—
Balances – end of year:			
Net liabilities	70,164	65,398	57,921
Reinsurance recoverable on unpaid losses	2,855	3,060	3,201
Gross liabilities	$ 73,019	$ 68,458	$ 61,122

Incurred losses and loss adjustment expenses in the preceding table were recorded in earnings in each period and related to insured events occurring in the current year ("current accident year") and events occurring in all prior years ("prior accident years"). Current accident year losses included approximately $1.0 billion in 2019, $1.6 billion in 2018 and $3.0 billion in 2017 from significant catastrophe events occurring in each year. The effects of businesses acquired (or disposed) are included (or excluded) on a retrospective basis for all years presented in the disaggregated accident year incurred and paid loss and allocated loss adjustment expenses data shown in this Note.

We recorded net reductions of estimated ultimate liabilities for prior accident years of $752 million in 2019, $1,406 million in 2018 and $544 million in 2017, which produced corresponding reductions in incurred losses and loss adjustment expenses. These reductions, as percentages of the net liabilities at the beginning of each year, were 1.1% in 2019, 2.4% in 2018 and 1.1% in 2017.

Estimated ultimate liabilities for prior years' loss events related to primary insurance were reduced by $457 million in 2019, $937 million in 2018 and $249 million in 2017. The decrease in 2019 was primarily attributable to lower than anticipated medical professional liability and workers' compensation losses, partially offset by higher commercial auto and other liability losses. The decreases in 2018 and 2017 were primarily related to workers' compensation and medical professional liability claims. Liabilities for prior years' private passenger auto claims were reduced in 2018 and increased in 2017. Estimated ultimate liabilities for prior years' loss events related to property and casualty reinsurance were reduced $295 million in 2019, $469 million in 2018 and $295 million in 2017.

(15) Unpaid losses and loss adjustment expenses *(Continued)*

Estimated claim liabilities include amounts for environmental, asbestos and other latent injury exposures, net of reinsurance recoverable, of approximately $1.7 billion at December 31, 2019 and 2018. These liabilities are subject to change due to changes in the legal and regulatory environment. We are unable to reliably estimate additional losses or a range of losses that are reasonably possible for these claims.

A reconciliation of the disaggregated net unpaid losses and allocated loss adjustment expenses (the latter referred to as "ALAE") of GEICO, Berkshire Hathaway Primary Group ("BH Primary") and Berkshire Hathaway Reinsurance Group ("BHRG") to our consolidated unpaid losses and loss adjustment expenses as of December 31, 2019 follows (in millions).

	GEICO Physical Damage	GEICO Auto Liability	BH Primary Medical Professional Liability	BH Primary Workers' Compensation and Other Casualty	BHRG Property	BHRG Casualty	Total
Unpaid losses and ALAE, net	$ 321	$ 18,475	$ 7,479	$ 9,568	$ 9,382	$ 21,304	$ 66,529
Reinsurance recoverable	—	1,014	54	597	268	852	2,785
Unpaid unallocated loss adjustment expenses							2,367
Other unpaid losses and loss adjustment expenses							1,338
Unpaid losses and loss adjustment expenses							$ 73,019

GEICO

GEICO's claim liabilities predominantly relate to various types of private passenger auto liability and physical damage claims. For such claims, we establish and evaluate unpaid claim liabilities using standard actuarial loss development methods and techniques. The actuarial methods utilize historical claims data, adjusted when deemed appropriate to reflect perceived changes in loss patterns. Claim liabilities include average, case, case development and IBNR estimates.

We establish average liabilities based on expected severities for newly reported physical damage and liability claims prior to establishing an individual case reserve when we have insufficient time or information to make specific claim estimates and for a large number of minor physical damage claims that once reported are quickly settled. We establish liability case loss estimates, which include loss adjustment expenses, once the facts and merits of the claim are evaluated.

Estimates for liability coverages are more uncertain than for physical damage coverages primarily due to the longer claim-tails, the greater chance of protracted litigation and the incompleteness of facts at the time the case estimate is first established. The "claim-tail" is the time period between the claim occurrence date and settlement date. Consequently, we establish additional case development liabilities, which are usually percentages of the case liabilities. For unreported claims, IBNR liabilities are estimated by projecting the ultimate number of claims expected (reported and unreported) for each significant coverage and deducting reported claims to produce estimated unreported claims. The product of the average cost per unreported claim and the number of unreported claims produces the IBNR liability estimate. We may record supplemental IBNR liabilities in certain situations when actuarial techniques are difficult to apply.

(15) Unpaid losses and loss adjustment expenses *(Continued)*

GEICO's incurred and paid losses and ALAE, net of reinsurance, are summarized by accident year below for physical damage and auto liability claims. IBNR and case development liabilities are as of December 31, 2019. Claim counts are established when accidents that may result in a liability are reported and are based on policy coverage. Each claim event may generate claims under multiple coverages, and thus may result in multiple counts. The "Cumulative Number of Reported Claims" includes the combined number of reported claims for all policy coverages and excludes projected IBNR claims. Dollars are in millions.

Physical Damage

Accident Year	Incurred Losses and ALAE through December 31, 2018*	2019	IBNR and Case Development Liabilities	Cumulative Number of Reported Claims (in thousands)
2018	$ 8,345	$ 8,274	$ 34	8,612
2019		9,020	334	8,772
	Incurred losses and ALAE	$ 17,294		

Accident Year	Cumulative Paid Losses and ALAE through December 31, 2018*	2019
2018	$ 8,078	$ 8,301
2019		8,678
	Paid losses and ALAE	16,979
	Net unpaid losses and ALAE for 2018 – 2019	315
	Net unpaid losses and ALAE for accident years before 2018	6
	Net unpaid losses and ALAE	$ 321

Auto Liability

Accident Year	Incurred Losses and ALAE through December 31, 2015*	2016*	2017*	2018*	2019	IBNR and Case Development Liabilities	Cumulative Number of Reported Claims (in thousands)
2015	$ 10,590	$ 10,666	$ 10,785	$ 10,824	$ 10,853	$ 156	2,338
2016		11,800	12,184	12,149	12,178	356	2,445
2017			14,095	13,864	13,888	983	2,628
2018				15,383	15,226	2,425	2,674
2019					16,901	4,694	2,577
				Incurred losses and ALAE	$ 69,046		

Accident Year	Cumulative Paid Losses and ALAE through December 31, 2015*	2016*	2017*	2018*	2019
2015	$ 4,579	$ 7,694	$ 9,133	$ 10,007	$ 10,472
2016		5,069	8,716	10,330	11,294
2017			5,806	9,944	11,799
2018				6,218	10,772
2019					6,742
				Paid losses and ALAE	51,079
				Net unpaid losses and ALAE for 2015 – 2019 accident years	17,967
				Net unpaid losses and ALAE for accident years before 2015	508
				Net unpaid losses and ALAE	$ 18,475

* *Unaudited required supplemental information*

Notes to Consolidated Financial Statements *(Continued)*

(15) Unpaid losses and loss adjustment expenses *(Continued)*

BH Primary

BH Primary's liabilities for unpaid losses and loss adjustment expenses primarily derive from medical professional liability and workers' compensation and other casualty insurance, including commercial auto and general liability insurance. Incurred and paid losses and ALAE are summarized by accident year in the following tables, disaggregated by medical professional liability coverages and workers' compensation and other casualty coverages. IBNR and case development liabilities are as of December 31, 2019. The cumulative number of reported claims reflects the number of individual claimants and includes claims that ultimately resulted in no liability or payment. Dollars are in millions.

BH Primary Medical Professional Liability

We estimate the ultimate expected incurred losses and loss adjustment expenses for medical professional claim liabilities using commonly accepted actuarial methodologies such as the paid and incurred development method, Bornhuetter-Ferguson based methods, hindsight outstanding severity method, trended severity method and trended pure premium method. These methodologies produce loss estimates from which we determine our best estimate. Periodically, we study developments in older accident years and adjust initial loss estimates to reflect recent development based upon claim age, coverage and litigation experience.

	Incurred Losses and ALAE through December 31,											
Accident Year	**2010***	**2011***	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019**	**IBNR and Case Development Liabilities**	**Cumulative Number of Reported Claims (in thousands)**
2010	$1,399	$1,346	$1,348	$1,329	$1,234	$1,140	$1,085	$1,031	$1,006	$ 991	$ 29	12
2011		1,346	1,334	1,321	1,262	1,173	1,115	1,050	1,004	968	38	11
2012			1,336	1,306	1,277	1,223	1,168	1,078	1,035	998	64	11
2013				1,328	1,296	1,261	1,195	1,127	1,086	1,019	93	11
2014					1,370	1,375	1,305	1,246	1,218	1,127	184	11
2015						1,374	1,342	1,269	1,290	1,218	301	12
2016							1,392	1,416	1,414	1,394	412	14
2017								1,466	1,499	1,495	685	18
2018									1,602	1,650	1,088	18
2019										1,670	1,369	12
									Incurred losses and ALAE	$12,530		

	Cumulative Paid Losses and ALAE through December 31,									
Accident Year	**2010***	**2011***	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019**
2010	$ 15	$ 95	$ 224	$ 377	$ 526	$ 654	$ 745	$ 810	$ 853	$ 888
2011		16	82	200	356	517	632	711	767	822
2012			15	93	218	377	522	642	725	789
2013				15	90	219	368	518	635	743
2014					21	106	238	396	540	671
2015						23	108	218	382	543
2016							22	115	274	461
2017								27	128	300
2018									35	166
2019										39
									Paid losses and ALAE	$ 5,422
									Net unpaid losses and ALAE for 2010 – 2019 accident years	7,108
									Net unpaid losses and ALAE for accident years before 2010	371
									Net unpaid losses and ALAE	$ 7,479

* *Unaudited required supplemental information*

Notes to Consolidated Financial Statements *(Continued)*

(15) Unpaid losses and loss adjustment expenses *(Continued)*

BH Primary Workers' Compensation and Other Casualty

We periodically evaluate ultimate loss and loss adjustment expense estimates for the workers' compensation and other casualty claims using a combination of commonly accepted actuarial methodologies such as the Bornhuetter-Ferguson and chain-ladder approaches using paid and incurred loss data. Paid and incurred loss data is segregated and analyzed by state due to the different state regulatory frameworks that may impact certain factors including the duration and amount of loss payments. We also separately study the various components of liabilities, such as employee lost wages, medical expenses and the costs of claims investigations and administration. We establish case liabilities for reported claims based upon the facts and circumstances of the claim. The excess of the ultimate projected losses, including the expected development of case estimates, and the case-basis liabilities is included in IBNR liabilities.

	Incurred Losses and ALAE through December 31,										
Accident Year	**2010***	**2011***	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019**	**IBNR and Expected Development on Reported Liabilities**	**Cumulative Number of Reported Claims (in thousands)**
2010	$ 662	$ 638	$ 612	$ 577	$ 560	$ 556	$ 548	$ 539	$ 531	$ 528	$ 36	41
2011		738	675	675	624	621	618	607	596	591	56	46
2012			873	850	837	791	780	762	750	736	76	53
2013				1,258	1,228	1,178	1,127	1,096	1,072	1,050	149	67
2014					1,743	1,638	1,614	1,548	1,482	1,497	220	90
2015						2,169	2,127	2,042	2,014	2,025	336	110
2016							2,511	2,422	2,359	2,325	533	114
2017								3,044	2,907	2,842	855	135
2018									3,544	3,412	1,445	151
2019										4,074	2,577	147
								Incurred losses and ALAE		$19,080		

	Cumulative Paid Losses and ALAE through December 31,									
Accident Year	**2010***	**2011***	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019**
2010	$ 102	$ 236	$ 314	$ 374	$ 417	$ 445	$ 459	$ 466	$ 472	$ 480
2011		109	220	333	403	453	481	496	505	512
2012			116	299	414	501	560	592	611	626
2013				177	422	609	725	793	835	858
2014					239	557	800	1,007	1,111	1,176
2015						289	700	1,017	1,289	1,488
2016							329	775	1,148	1,461
2017								441	1,003	1,434
2018									538	1,198
2019										682
								Paid losses and ALAE		9,915
				Net unpaid losses and ALAE for 2010 – 2019 accident years						9,165
				Net unpaid losses and ALAE for accident years before 2010						403
								Net unpaid losses and ALAE		$ 9,568

* *Unaudited required supplemental information*

BHRG

We use a variety of methodologies to establish BHRG's estimates for property and casualty claims liabilities. We use certain methodologies, such as paid and incurred loss development techniques, incurred and paid loss Bornhuetter-Ferguson techniques and frequency and severity techniques, as well as ground-up techniques when appropriate.

Our claims liabilities are principally a function of reported losses from ceding companies, case development and IBNR liability estimates. Case loss estimates are reported under our contracts either individually or in bulk as provided under the terms of the contracts. We may independently evaluate case losses reported by the ceding company, and if deemed appropriate, we may establish case liabilities based on our estimates.

(15) Unpaid losses and loss adjustment expenses *(Continued)*

Estimated IBNR liabilities are affected by expected case loss emergence patterns and expected loss ratios, which are evaluated as groups of contracts with similar exposures or on a contract-by-contract basis. Case and IBNR liability estimates for major catastrophe events are generally based on a per-contract assessment of the ultimate cost associated with the individual loss event. Claim count data is not provided consistently by ceding companies under our contracts or is otherwise considered unreliable.

Incurred and paid losses and ALAE of BHRG are disaggregated based on losses that are expected to have shorter claim-tails (property) and losses expected to have longer claim-tails (casualty). Under certain contracts, the coverage can apply to multiple lines of business written by the ceding company, whether property, casualty or combined, and the ceding company may not report loss data by such lines consistently, if at all. In those instances, we allocated losses to property and casualty coverages based on internal estimates. BHRG's disaggregated incurred and paid losses and ALAE are summarized by accident year, net of reinsurance. IBNR and case development liabilities are as of December 31, 2019. Dollars are in millions.

BHRG Property

	Incurred Losses and ALAE through December 31,										
Accident Year	**2010***	**2011***	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019**	**IBNR and Case Development Liabilities**
2010	$ 2,516	$ 2,475	$ 2,354	$ 2,226	$ 2,138	$ 2,103	$ 2,085	$ 2,064	$ 2,074	$ 2,062	$ 23
2011		4,197	4,138	3,851	3,754	3,753	3,723	3,700	3,686	3,674	41
2012			3,132	2,828	2,624	2,384	2,331	2,328	2,311	2,295	47
2013				3,181	3,022	2,679	2,589	2,569	2,510	2,459	61
2014					2,615	2,417	2,306	2,162	2,107	2,035	77
2015						3,243	3,084	2,528	2,935	2,932	208
2016							3,266	3,892	3,617	3,594	281
2017								5,258	4,959	4,807	478
2018									4,366	4,468	1,025
2019										4,100	1,977
									Incurred losses and ALAE	$32,426	

	Cumulative Paid Losses and ALAE through December 31,									
Accident Year	**2010***	**2011***	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019**
2010	$ 335	$ 1,059	$ 1,485	$ 1,742	$ 1,905	$ 1,954	$ 2,000	$ 2,024	$ 2,031	$ 2,043
2011		664	2,305	2,957	3,219	3,336	3,426	3,467	3,512	3,530
2012			260	1,219	1,797	1,935	2,023	2,099	2,118	2,163
2013				513	1,416	1,854	2,050	2,170	2,251	2,290
2014					464	1,235	1,561	1,699	1,764	1,814
2015						574	1,591	1,940	2,134	2,239
2016							705	1,790	2,181	2,641
2017								1,027	2,716	3,638
2018									907	2,309
2019										747
									Paid losses and ALAE	23,414
									Net unpaid losses and ALAE for 2010 – 2019 accident years	9,012
									Net unpaid losses and ALAE for accident years before 2010	370
									Net unpaid losses and ALAE	$ 9,382

* *Unaudited required supplemental information*

Notes to Consolidated Financial Statements *(Continued)*

(15) Unpaid losses and loss adjustment expenses *(Continued)*

BHRG Casualty

	Incurred Losses and ALAE through December 31,										
Accident Year	**2010***	**2011***	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019**	**IBNR and Case Development Liabilities**
2010	$ 2,296	$ 2,383	$ 2,316	$ 2,253	$ 2,135	$ 2,085	$ 2,040	$ 1,878	$ 1,958	$ 1,913	$ 203
2011		2,602	2,690	2,560	2,500	2,411	2,320	2,313	2,274	2,240	299
2012			2,784	2,962	2,797	2,861	2,790	2,678	2,611	2,554	318
2013				2,124	2,257	2,287	2,131	2,077	2,023	1,928	411
2014					1,863	2,058	2,027	1,990	1,904	1,942	574
2015						1,870	2,071	2,098	1,999	1,872	534
2016							1,900	2,106	2,014	1,971	680
2017								2,186	2,674	2,552	941
2018									2,914	3,544	1,511
2019										3,405	2,348
							Incurred losses and ALAE			$23,921	

	Cumulative Paid Losses and ALAE through December 31,									
Accident Year	**2010***	**2011***	**2012***	**2013***	**2014***	**2015***	**2016***	**2017***	**2018***	**2019**
2010	$ 117	$ 542	$ 834	$ 1,022	$ 1,274	$ 1,369	$ 1,433	$ 1,478	$ 1,526	$ 1,552
2011		289	812	1,155	1,395	1,483	1,575	1,653	1,693	1,727
2012			307	745	1,136	1,365	1,522	1,646	1,746	1,805
2013				290	517	802	930	1,034	1,135	1,195
2014					149	474	639	748	871	955
2015						195	487	710	830	921
2016							252	553	730	860
2017								230	562	816
2018									264	865
2019										351
									Paid losses and ALAE	11,047
					Net unpaid losses and ALAE for 2010 – 2019 accident years					12,874
					Net unpaid losses and ALAE for accident years before 2010					8,430
									Net unpaid losses and ALAE	$21,304

* *Unaudited required supplemental information*

(15) Unpaid losses and loss adjustment expenses *(Continued)*

Required supplemental unaudited average historical claims duration information based on the net losses and ALAE incurred and paid accident year data in the preceding tables follows. The percentages show the average portions of net losses and ALAE paid by each succeeding year, with year 1 representing the current accident year.

Average Annual Percentage Payout of Incurred Losses by Age, Net of Reinsurance

In Year	1	2	3	4	5	6	7	8	9	10
GEICO Physical Damage	98%	2%								
GEICO Auto Liability	42%	29%	13%	8%	4%					
BH Primary Medical Professional Liability	2%	7%	12%	15%	15%	12%	9%	6%	5%	4%
BH Primary Workers' Compensation and Other Casualty	16%	21%	16%	12%	8%	5%	3%	2%	1%	2%
BHRG Property	19%	36%	17%	9%	4%	3%	1%	1%	0%	1%
BHRG Casualty	10%	17%	13%	8%	7%	5%	4%	2%	2%	1%

(16) Retroactive reinsurance contracts

Retroactive reinsurance policies provide indemnification of losses and loss adjustment expenses of short-duration insurance contracts with respect to underlying loss events that occurred prior to the contract inception date. Claims payments may commence immediately after the contract date or, when applicable, once a contractual retention amount has been reached. Reconciliations of the changes in estimated liabilities for retroactive reinsurance unpaid losses and loss adjustment expenses ("claim liabilities") and related deferred charge reinsurance assumed assets for each of the three years ended December 31, 2019 follows (in millions).

	2019		2018		2017	
	Unpaid losses and loss adjustment expenses	Deferred charges reinsurance assumed	Unpaid losses and loss adjustment expenses	Deferred charges reinsurance assumed	Unpaid losses and loss adjustment expenses	Deferred charges reinsurance assumed
Balances – beginning of year	$ 41,834	$(14,104)	$ 42,937	$(15,278)	$ 24,972	$ (8,047)
Incurred losses and loss adjustment expenses						
Current year contracts	1,138	(453)	603	(86)	19,005	(7,730)
Prior years' contracts	378	810	(341)	1,260	(41)	499
Total	1,516	357	262	1,174	18,964	(7,231)
Paid losses and loss adjustment expenses	(909)	—	(1,365)	—	(999)	—
Balances – end of year	$ 42,441	$(13,747)	$ 41,834	$(14,104)	$ 42,937	$(15,278)
Incurred losses and loss adjustment expenses, net of deferred charges	$ 1,873		$ 1,436		$ 11,733	

In the preceding table, classifications of incurred losses and loss adjustment expenses are based on the inception dates of the contracts. We do not believe that analysis of losses incurred and paid by accident year of the underlying event is relevant or meaningful given that our exposure to losses incepts when the contract incepts. Further, we believe the classifications of reported claims and case development liabilities has little or no practical analytical value.

In the first quarter of 2017, we entered into an agreement with various subsidiaries of American International Group, Inc. (collectively, "AIG") to indemnify AIG for 80% of up to $25 billion of losses and allocated loss adjustment expenses in excess of $25 billion retained by AIG, with respect to certain commercial insurance loss events occurring prior to 2016. At the inception of the contract, we recorded premiums earned of $10.2 billion, and we also recorded a liability for unpaid losses and loss adjustment expenses of $16.4 billion and a deferred charge reinsurance assumed asset of $6.2 billion.

In the fourth quarter of 2017, we increased our estimated ultimate claim liabilities under the aforementioned AIG contract by approximately $1.8 billion based on higher than expected loss payments reported by AIG under the contractual retention. We also increased the related deferred charge asset by $1.7 billion based on our re-estimation of the amounts and timing of future claim payments. The estimated ultimate claim liabilities with respect to the AIG contract were approximately $18.2 billion at both December 31, 2019 and 2018 and the related deferred charge assets were approximately $6.3 billion at December 31, 2019 and $6.9 billion at December 31, 2018.

(16) Retroactive reinsurance contracts *(Continued)*

Incurred losses and loss adjustment expenses related to contracts written in prior years were $1,188 million in 2019, $919 million in 2018 and $458 million in 2017, which included recurring amortization of deferred charges and the effect of changes in the timing and amount of expected future loss payments.

In establishing retroactive reinsurance claim liabilities, we analyze historical aggregate loss payment patterns and project losses into the future under various probability-weighted scenarios. We expect the claim-tail to be very long for many contracts, with some lasting several decades. We monitor claim payment activity and review ceding company reports and other information concerning the underlying losses. We reassess and revise the expected timing and amounts of ultimate losses periodically or when significant events are revealed through our monitoring and review processes.

Our retroactive reinsurance claim liabilities include estimated liabilities for environmental, asbestos and other latent injury exposures of approximately $12.9 billion at December 31, 2019 and $13.1 billion at December 31, 2018. Retroactive reinsurance contracts are generally subject to aggregate policy limits and thus, our exposure to such claims under these contracts is likewise limited. We monitor evolving case law and its effect on environmental and other latent injury claims. Changing laws or government regulations, newly identified toxins, newly reported claims, new theories of liability, new contract interpretations and other factors could result in increases in these liabilities, which could be material to our results of operations. We are unable to reliably estimate the amount of additional net loss or the range of net loss that is reasonably possible.

(17) Notes payable and other borrowings

Notes payable and other borrowings are summarized below (in millions). The weighted average interest rates and maturity date ranges shown in the following tables are based on borrowings as of December 31, 2019.

	Weighted Average Interest Rate	December 31, 2019	December 31, 2018
Insurance and other:			
Berkshire Hathaway Inc. (“Berkshire”):			
U.S. Dollar denominated due 2020-2047	3.2%	$ 8,324	$ 9,065
Euro denominated due 2020-2035	1.1%	7,641	7,806
Japanese Yen denominated due 2024-2049	0.5%	3,938	—
Berkshire Hathaway Finance Corporation (“BHFC”):			
U.S. Dollar denominated due 2020-2049	4.1%	8,679	10,650
Great Britain Pound denominated due 2039-2059	2.5%	2,274	—
Other subsidiary borrowings due 2020-2045	4.0%	5,262	5,597
Short-term subsidiary borrowings	3.9%	1,472	1,857
		$ 37,590	$ 34,975

In September 2019, Berkshire issued ¥430.0 billion of senior notes consisting of ¥108.5 billion of 0.17% senior notes due in 2024, ¥61.0 billion of 0.27% senior notes due in 2026, ¥146.5 billion of 0.44% senior notes due in 2029, ¥19.0 billion of 0.787% senior notes due in 2034, ¥59.0 billion of 0.965% senior notes due in 2039 and ¥36.0 billion of 1.108% senior notes due in 2049.

Borrowings of BHFC, a wholly-owned finance subsidiary of Berkshire, consist of senior unsecured notes used to fund manufactured housing loans originated or acquired and equipment held for lease of certain subsidiaries. During 2019, BHFC repaid $3.95 billion of maturing senior notes. In 2019, BHFC issued $2.0 billion of 4.25% senior notes due in 2049 and £1.75 billion of senior notes consisting of £1.0 billion of 2.375% senior notes due in 2039 and £750 million of 2.625% senior notes due in 2059. Such borrowings are fully and unconditionally guaranteed by Berkshire.

The carrying values of our non-U.S. Dollar denominated senior notes (€6.85 billion, £1.75 billion and ¥430 billion par) reflect the applicable exchange rates as of the balance sheet dates. The effects of changes in foreign currency exchange rates during the period are recorded in earnings as a component of selling, general and administrative expenses. Changes in the exchange rates resulted in pre-tax gains of $192 million in 2019 and $366 million in 2018 and losses of $990 million in 2017.

(17) Notes payable and other borrowings *(Continued)*

In addition to BHFC borrowings, at December 31, 2019, Berkshire has guaranteed approximately $1.2 billion of other subsidiary borrowings. Generally, Berkshire's guarantee of a subsidiary's debt obligation is an absolute, unconditional and irrevocable guarantee for the full and prompt payment when due of all payment obligations.

	Weighted Average Interest Rate	December 31, 2019	December 31, 2018
Railroad, utilities and energy:			
Berkshire Hathaway Energy Company ("BHE") and subsidiaries:			
BHE senior unsecured debt due 2020-2049	4.6%	$ 8,581	$ 8,577
Subsidiary and other debt due 2020-2064	4.5%	30,772	28,196
Short-term debt	2.5%	3,214	2,516
Burlington Northern Santa Fe and subsidiaries due 2020-2097	4.6%	23,211	23,226
		$ 65,778	$ 62,515

BHE subsidiary debt represents amounts issued pursuant to separate financing agreements. Substantially all of the assets of certain BHE subsidiaries are, or may be, pledged or encumbered to support or otherwise secure debt. These borrowing arrangements generally contain various covenants, including covenants which pertain to leverage ratios, interest coverage ratios and/or debt service coverage ratios. During 2019, BHE and its subsidiaries issued approximately $4.6 billion of long-term debt, with maturity dates ranging from 2029 to 2059 and with a weighted average interest rate of 3.6%. In January 2020, a BHE subsidiary issued $725 million of term debt consisting of $425 million of 2.4% notes due in 2030 and $300 million of 3.125% notes due in 2050.

BNSF's borrowings are primarily senior unsecured debentures. In July 2019, BNSF issued $825 million of 3.55% senior unsecured debentures due in 2050. As of December 31, 2019, BNSF, BHE and their subsidiaries were in compliance with all applicable debt covenants. Berkshire does not guarantee any debt, borrowings or lines of credit of BNSF, BHE or their subsidiaries.

As of December 31, 2019, our subsidiaries had unused lines of credit and commercial paper capacity aggregating approximately $7.1 billion to support short-term borrowing programs and provide additional liquidity. Such unused lines of credit included approximately $5.6 billion related to BHE and its subsidiaries.

Debt principal repayments expected during each of the next five years are as follows (in millions).

	2020	2021	2022	2023	2024
Insurance and other	$ 4,097	$ 3,246	$ 1,609	$ 5,341	$ 2,190
Railroad, utilities and energy	6,323	2,225	3,349	4,061	2,890
	$ 10,420	$ 5,471	$ 4,958	$ 9,402	$ 5,080

(18) Income taxes

The liabilities for income taxes reflected in our Consolidated Balance Sheets are as follows (in millions).

	December 31, 2019	December 31, 2018
Currently payable	$ 24	$ 323
Deferred	65,823	50,503
Other	952	549
	$ 66,799	$ 51,375

(18) Income taxes *(Continued)*

On December 22, 2017, President Trump signed into law legislation known as the Tax Cuts and Jobs Act of 2017 ("TCJA"). Among its provisions, the TCJA reduced the statutory U.S. Corporate income tax rate from 35% to 21% effective January 1, 2018. The TCJA also provided for a one-time tax on certain accumulated undistributed post-1986 earnings of foreign subsidiaries. Further, the TCJA includes provisions that, in certain instances, impose U.S. income tax liabilities on earnings of foreign subsidiaries and limit the deductibility of interest expenses. The TCJA also provides for accelerated deductions of certain capital expenditures made after September 27, 2017 through bonus depreciation.

In 2017, upon the enactment of the TCJA, we recorded a reduction in our deferred income tax liabilities of approximately $35.6 billion for the effect of the reduction in the U.S. statutory income tax rate. As a result, we recorded an income tax benefit of approximately $29.6 billion and we increased regulatory liabilities of our regulated utility subsidiaries by approximately $6.0 billion for the portion of the deferred income tax liability reduction that we will be required to, effectively, refund to customers in the rate setting process. We also recognized an income tax charge of approximately $1.4 billion with respect to the deemed repatriation of the accumulated undistributed post-1986 earnings of our foreign subsidiaries. Thus, upon the enactment of the TCJA, we included a net income tax benefit in our 2017 earnings of approximately $28.2 billion. In 2018, we reduced our estimate of the income taxes on the deemed repatriation of earnings of foreign subsidiaries and recognized additional deferred income tax rate change effects.

The tax effects of temporary differences that give rise to significant portions of deferred tax assets and deferred tax liabilities are shown below (in millions).

	December 31, 2019	December 31, 2018
Deferred tax liabilities:		
Investments – unrealized appreciation and cost basis differences	$ 32,134	$ 17,765
Deferred charges reinsurance assumed	2,890	2,970
Property, plant and equipment and equipment held for lease	29,388	28,279
Goodwill and other intangible assets	7,293	7,199
Other	3,144	3,187
	74,849	59,400
Deferred tax assets:		
Unpaid losses and loss adjustment expenses	(1,086)	(1,238)
Unearned premiums	(853)	(767)
Accrued liabilities	(1,981)	(1,956)
Regulatory liabilities	(1,610)	(1,673)
Other	(3,496)	(3,263)
	(9,026)	(8,897)
Net deferred tax liability	$ 65,823	$ 50,503

We have not established deferred income taxes on accumulated undistributed earnings of certain foreign subsidiaries, which are expected to be reinvested indefinitely. Repatriation of all accumulated earnings of foreign subsidiaries would be impracticable to the extent that such earnings represent capital to support normal business operations. Generally, no U.S. federal income taxes will be imposed on future distributions of foreign earnings under current law. However, distributions to the U.S. or other foreign jurisdictions could be subject to withholding and other local taxes.

Income tax expense reflected in our Consolidated Statements of Earnings for each of the three years ending December 31, 2019 is as follows (in millions).

	2019	2018	2017
Federal	$ 19,069	$ (1,613)	$ (23,427)
State	625	175	894
Foreign	1,210	1,117	1,018
	$ 20,904	$ (321)	$ (21,515)
Current	$ 5,818	$ 5,176	$ 3,299

Deferred	15,086	(5,497)	(24,814)
	$ 20,904	$ (321)	$ (21,515)

(18) Income taxes *(Continued)*

Income tax expense is reconciled to hypothetical amounts computed at the U.S. federal statutory rate for each of the three years ending December 31, 2019 in the table below (in millions).

	2019	2018	2017
Earnings before income taxes	$ 102,696	$ 4,001	$ 23,838
Hypothetical income tax expense computed at the U.S. federal statutory rate	$ 21,566	$ 840	$ 8,343
Dividends received deduction and tax-exempt interest	(433)	(393)	(905)
State income taxes, less U.S. federal income tax benefit	494	138	465
Foreign tax rate differences	(6)	271	(339)
U.S. income tax credits	(942)	(711)	(636)
Net benefit from the enactment of the TCJA	—	(302)	(28,200)
Other differences, net	225	(164)	(243)
	$ 20,904	$ (321)	$ (21,515)

We file income tax returns in the United States and in state, local and foreign jurisdictions. We have settled income tax liabilities with the U.S. federal taxing authority ("IRS") for tax years through 2011. The IRS is auditing Berkshire's consolidated U.S. federal income tax returns for the 2012 through 2016 tax years. We are also under audit or subject to audit with respect to income taxes in many state and foreign jurisdictions. It is reasonably possible that certain of these income tax examinations will be settled in 2020. We currently do not believe that the outcome of unresolved issues or claims will be material to our Consolidated Financial Statements.

At December 31, 2019 and 2018, net unrecognized tax benefits were $952 million and $549 million, respectively. Included in the balance at December 31, 2019, were $795 million of tax positions that, if recognized, would impact the effective tax rate. The remaining balance in net unrecognized tax benefits principally relates to tax positions where the ultimate recognition is highly certain but there is uncertainty about the timing of recognition. Because of the impact of deferred income tax accounting, these positions, when recognized, would not affect the annual effective income tax rate. In 2019, we recorded income tax expense of $377 million for uncertain tax positions related to investments by a subsidiary in certain tax equity investment funds that generated income tax benefits from 2015 through 2018. We now believe that it is more likely than not those income tax benefits are not valid. As of December 31, 2019, we do not expect any material increases to the estimated amount of unrecognized tax benefits in the next twelve months.

(19) Dividend restrictions – Insurance subsidiaries

Payments of dividends by our insurance subsidiaries are restricted by insurance statutes and regulations. Without prior regulatory approval, our principal insurance subsidiaries may declare up to approximately $21 billion as ordinary dividends during 2020.

Combined shareholders' equity of U.S. based insurance subsidiaries determined pursuant to statutory accounting rules (Surplus as Regards Policyholders) was approximately $216 billion at December 31, 2019 and $162 billion at December 31, 2018. Statutory surplus differs from the corresponding amount based on GAAP due to differences in accounting for certain assets and liabilities. For instance, deferred charges reinsurance assumed, deferred policy acquisition costs, unrealized gains on certain investments and related deferred income taxes are recognized for GAAP but not for statutory reporting purposes. In addition, the carrying values of certain assets, such as goodwill and the carrying values of non-insurance entities owned by our insurance subsidiaries, are not fully recognized for statutory reporting purposes.

(20) Fair value measurements

Our financial assets and liabilities are summarized below as of December 31, 2019 and December 31, 2018, with fair values shown according to the fair value hierarchy (in millions). The carrying values of cash and cash equivalents, U.S. Treasury Bills, receivables and accounts payable, accruals and other liabilities are considered to be reasonable estimates of their fair values.

	Carrying Value	Fair Value	Quoted Prices (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
December 31, 2019					
Investments in fixed maturity securities:					
U.S. Treasury, U.S. government corporations and agencies	$ 3,090	$ 3,090	$ 3,046	$ 44	$ —
Foreign governments	8,638	8,638	5,437	3,201	—
Corporate bonds	6,352	6,352	—	6,350	2
Other	605	605	—	605	—
Investments in equity securities	248,027	248,027	237,271	46	10,710
Investment in Kraft Heinz common stock	13,757	10,456	10,456	—	—
Loans and finance receivables	17,527	17,861	—	1,809	16,052
Derivative contract assets *(1)*	145	145	—	23	122
Derivative contract liabilities:					
Railroad, utilities and energy *(1)*	76	76	6	59	11
Equity index put options	968	968	—	—	968
Notes payable and other borrowings:					
Insurance and other	37,590	40,589	—	40,569	20
Railroad, utilities and energy	65,778	76,237	—	76,237	—
December 31, 2018					
Investments in fixed maturity securities:					
U.S. Treasury, U.S. government corporations and agencies	$ 4,223	$ 4,223	$ 2,933	$ 1,290	$ —
Foreign governments	7,502	7,502	5,417	2,085	—
Corporate bonds	7,440	7,440	—	7,434	6
Other	733	733	—	733	—
Investments in equity securities	172,757	172,757	172,253	203	301
Investment in Kraft Heinz common stock	13,813	14,007	14,007	—	—
Loans and finance receivables	16,280	16,377	—	1,531	14,846
Derivative contract assets *(1)*	172	172	2	52	118
Derivative contract liabilities:					
Railroad, utilities and energy *(1)*	111	111	1	101	9
Equity index put options	2,452	2,452	—	—	2,452
Notes payable and other borrowings:					
Insurance and other	34,975	35,361	—	35,335	26
Railroad, utilities and energy	62,515	66,422	—	66,422	—

(1) *Assets are included in other assets and liabilities are included in accounts payable, accruals and other liabilities.*

(20) Fair value measurements *(Continued)*

The fair values of substantially all of our financial instruments were measured using market or income approaches. The hierarchy for measuring fair value consists of Levels 1 through 3, which are described below.

Level 1 – Inputs represent unadjusted quoted prices for identical assets or liabilities exchanged in active markets.

Level 2 – Inputs include directly or indirectly observable inputs (other than Level 1 inputs) such as quoted prices for similar assets or liabilities exchanged in active or inactive markets; quoted prices for identical assets or liabilities exchanged in inactive markets; other inputs that may be considered in fair value determinations of the assets or liabilities, such as interest rates and yield curves, volatilities, prepayment speeds, loss severities, credit risks and default rates; and inputs that are derived principally from or corroborated by observable market data by correlation or other means. Pricing evaluations generally reflect discounted expected future cash flows, which incorporate yield curves for instruments with similar characteristics, such as credit ratings, estimated durations and yields for other instruments of the issuer or entities in the same industry sector.

Level 3 – Inputs include unobservable inputs used in the measurement of assets and liabilities. Management is required to use its own assumptions regarding unobservable inputs because there is little, if any, market activity in the assets or liabilities and it may be unable to corroborate the related observable inputs. Unobservable inputs require management to make certain projections and assumptions about the information that would be used by market participants in valuing assets or liabilities.

Reconciliations of assets and liabilities measured and carried at fair value on a recurring basis with the use of significant unobservable inputs (Level 3) for each of the three years ending December 31, 2019 follow (in millions).

	Investments in equity and fixed maturity securities	Net derivative contract liabilities
Balance December 31, 2016	$ 17,321	$ (2,824)
Gains (losses) included in:		
Earnings	—	888
Other comprehensive income	1,157	(3)
Regulatory assets and liabilities	—	(1)
Dispositions and settlements	(59)	(129)
Transfers into/out of Level 3	(18,413)	—
Balance December 31, 2017	6	(2,069)
Gains (losses) included in:		
Earnings	—	(118)
Other comprehensive income	—	2
Regulatory assets and liabilities	—	3
Acquisitions	2	3
Dispositions and settlements	(1)	(164)

Balance December 31, 2018	7	(2,343)
Gains (losses) included in:		
Earnings	404	1,972
Other comprehensive income	—	(1)
Regulatory assets and liabilities	—	(26)
Acquisitions	10,000	6
Dispositions and settlements	(4)	(465)
Balance December 31, 2019	$ 10,407	$ (857)

(20) Fair value measurements *(Continued)*

We acquired investments in Occidental Cumulative Perpetual Preferred Stock ("Occidental Preferred") and Occidental common stock warrants in August 2019 at an aggregate cost of $10 billion. We currently consider the fair value measurements to contain Level 3 inputs. See Note 4. We acquired preferred stock and common stock warrants of Bank of America Corporation ("BAC") in 2011. We exercised the BAC warrants to acquire BAC common stock in August 2017. As payment of the cost to acquire the BAC common stock, we surrendered substantially all of the BAC preferred stock. Additionally, in December 2017, Restaurant Brands International Inc. ("RBI") redeemed a $3 billion private placement security that we acquired in 2014. During 2017, we concluded the Level 3 inputs used in the previous fair value determinations of the BAC warrants, BAC preferred stock and RBI investments were not significant and we transferred these measurements from Level 3 to Level 2.

Quantitative information as of December 31, 2019, with respect to assets and liabilities measured and carried at fair value on a recurring basis with the use of significant unobservable inputs (Level 3) follows (in millions).

	Fair Value	Principal Valuation Techniques	Unobservable Inputs	Weighted Average
Investments in equity securities:				
Preferred stock	$ 10,314	Discounted cash flow	Expected duration	10 years
			Discount for transferability restrictions and subordination	375 basis points
Common stock warrants	90	Warrant pricing model	Expected duration	10 years
			Volatility	26%
Derivative contract liabilities	968	Option pricing model	Volatility	16%

Investments in equity securities at December 31, 2019 included the Occidental Preferred and common stock warrants. These investments are subject to contractual restrictions on transferability and contain provisions that currently prevent us from economically hedging our investments. In applying discounted cash flow techniques in valuing the Occidental Preferred, we made assumptions regarding the expected duration of the investment. The Occidental Preferred is redeemable at Occidental's option beginning in 2029. We also made estimates regarding the impact of subordination, as the Occidental Preferred has a lower priority in liquidation than debt instruments. In valuing the Occidental common stock warrants, we used a warrant valuation model. While most of the inputs to the model are observable, we made assumptions regarding the expected duration and volatility of the warrants. The Occidental common stock warrants expire on the one-year anniversary on which no Occidental Preferred remains outstanding.

Our equity index put option contracts are illiquid and contain contract terms that are not standard in derivatives markets. For example, we are not required to post collateral under most of our contracts. We determine the fair value of the equity index put option contract liabilities based on the Black-Scholes option valuation model. Given the current index values, remaining contract durations and applicable strike prices for these contracts, we believe the only significant model input after December 31, 2019 is the prevailing index price, which is observable.

(21) Common stock

Changes in Berkshire's issued, treasury and outstanding common stock during the three years ending December 31, 2019 are shown in the table below. In addition to our common stock, 1,000,000 shares of preferred stock are authorized, but none are issued.

	Class A, $5 Par Value (1,650,000 shares authorized)			Class B, $0.0033 Par Value (3,225,000,000 shares authorized)		
	Issued	Treasury	Outstanding	Issued	Treasury	Outstanding
Balance December 31, 2016	788,058	(11,680)	776,378	1,303,323,927	(1,409,762)	1,301,914,165
Conversions of Class A common stock to Class B common stock and exercises of replacement stock options	(25,303)	—	(25,303)	38,742,822	—	38,742,822
Balance December 31, 2017	762,755	(11,680)	751,075	1,342,066,749	(1,409,762)	1,340,656,987
Conversions of Class A common stock to Class B common stock and exercises of replacement stock options	(20,542)	—	(20,542)	31,492,234	—	31,492,234
Treasury stock acquired	—	(1,217)	(1,217)	—	(4,729,147)	(4,729,147)
Balance December 31, 2018	742,213	(12,897)	729,316	1,373,558,983	(6,138,909)	1,367,420,074
Conversions of Class A common stock to Class B common stock and exercises of replacement stock options	(22,906)	—	(22,906)	34,624,869	—	34,624,869
Treasury stock acquired	—	(4,440)	(4,440)	—	(17,563,410)	(17,563,410)
Balance December 31, 2019	719,307	(17,337)	701,970	1,408,183,852	(23,702,319)	1,384,481,533

Each Class A common share is entitled to one vote per share. Class B common stock possesses dividend and distribution rights equal to one-fifteen-hundredth (1/1,500) of such rights of Class A common stock. Each Class B common share possesses voting rights equivalent to one-ten-thousandth (1/10,000) of the voting rights of a Class A share. Unless otherwise required under Delaware General Corporation Law, Class A and Class B common shares vote as a single class. Each share of Class A common stock is convertible, at the option of the holder, into 1,500 shares of Class B common stock. Class B common stock is not convertible into Class A common stock. On an equivalent Class A common stock basis, there were 1,624,958 shares outstanding as of December 31, 2019 and 1,640,929 shares outstanding as of December 31, 2018.

Since we have two classes of common stock, we provide earnings per share data on the Consolidated Statements of Earnings for average equivalent Class A shares outstanding and average equivalent Class B shares outstanding. Class B shares are economically equivalent to one-fifteen-hundredth (1/1,500) of a Class A share. Average equivalent Class A shares outstanding represents average Class A shares outstanding plus one-fifteen-hundredth (1/1,500) of the average Class B shares outstanding. Average equivalent Class B shares outstanding represents average Class B shares outstanding plus 1,500 times average Class A shares outstanding.

For several years, Berkshire had a common stock repurchase program, which permitted Berkshire to repurchase its Class A and Class B shares at prices no higher than a 20% premium over the book value of the shares. In 2018, Berkshire's Board of Directors authorized an amendment to the program, permitting Berkshire to repurchase shares any time that Warren Buffett, Berkshire's Chairman of the Board and Chief Executive Officer, and Charlie Munger, Vice Chairman of the Board, believe that the repurchase price is below Berkshire's intrinsic value, conservatively determined. The program continues to allow share repurchases in the open market or through privately negotiated transactions and does not specify a maximum number of shares to be repurchased. However, repurchases will not be made if they would reduce the total value of Berkshire's consolidated cash, cash equivalents and U.S. Treasury Bill holdings below $20 billion. The repurchase program does not obligate Berkshire to repurchase any specific dollar amount or number of Class A or Class B shares and there is no expiration date to the program.

(22) Accumulated other comprehensive income

A summary of the net changes in after-tax accumulated other comprehensive income attributable to Berkshire Hathaway shareholders and amounts reclassified out of accumulated other comprehensive income for each of the three years ending December 31, 2019 follows (in millions).

	Unrealized appreciation of investments, net	Foreign currency translation	Defined benefit pension plans	Other	Accumulated other comprehensive income
Balance December 31, 2016	$ 43,176	$ (5,268)	$ (593)	$ (17)	$ 37,298
Other comprehensive income, net before reclassifications	19,826	2,151	65	16	22,058
Reclassifications into net earnings:					
Reclassifications before income taxes	(1,399)	3	155	19	(1,222)
Applicable income taxes	490	—	(47)	(6)	437
Balance December 31, 2017	62,093	(3,114)	(420)	12	58,571
Reclassifications to retained earnings upon adoption of new accounting standards	(61,340)	(65)	36	(6)	(61,375)
Other comprehensive income, net before reclassifications	(183)	(1,424)	(513)	25	(2,095)
Reclassifications into net earnings:					
Reclassifications before income taxes	(253)	—	116	5	(132)
Applicable income taxes	53	—	(35)	(2)	16
Balance December 31, 2018	370	(4,603)	(816)	34	(5,015)
Other comprehensive income, net before reclassifications	160	257	(644)	(48)	(275)
Reclassifications into net earnings:					
Reclassifications before income taxes	(62)	—	95	9	42
Applicable income taxes	13	—	(4)	(4)	5
Balance December 31, 2019	$ 481	$ (4,346)	$ (1,369)	$ (9)	$ (5,243)

(23) Supplemental cash flow information

A summary of supplemental cash flow information for each of the three years ending December 31, 2019 is presented in the following table (in millions).

	2019	2018	2017
Cash paid during the period for:			
Income taxes	$ 5,415	$ 4,354	$ 3,286
Interest:			
Insurance and other	1,011	1,111	1,260
Railroad, utilities and energy	2,879	2,867	2,828
Non-cash investing and financing activities:			
Liabilities assumed in connection with business acquisitions	766	3,735	747
Right-of-use assets obtained in exchange for new operating lease liabilities	782	—	—
Equity securities surrendered in connection with warrant exercise	—	—	4,965

(24) Revenues from contracts with customers

On January 1, 2018, we adopted ASC 606 "Revenues from Contracts with Customers." Under ASC 606, revenues are recognized when a good or service is transferred to a customer. A good or service is transferred when or as the customer obtains control of that good or service. Revenues are based on the consideration we expect to receive in connection with our promises to deliver goods and services to our customers.

The following tables summarize customer contract revenues disaggregated by reportable segment and the source of the revenue for the years ended December 31, 2019 and 2018 (in millions). Other revenues included in consolidated revenues were primarily insurance premiums earned, interest, dividend and other investment income and leasing revenues which are not within the scope of ASC 606.

2019	Manufacturing	McLane Company	Service and Retail	BNSF	Berkshire Hathaway Energy	Insurance, Corporate and other	Total
Manufactured products:							
Industrial and commercial products	$25,311	$ —	$ 184	$ —	$ —	$ —	$ 25,495
Building products	15,620	—	—	—	—	—	15,620
Consumer products	14,120	—	—	—	—	—	14,120
Grocery and convenience store distribution	—	33,057	—	—	—	—	33,057
Food and beverage distribution	—	16,767	—	—	—	—	16,767
Auto sales	—	—	8,481	—	—	—	8,481
Other retail and wholesale distribution	2,299	—	12,213	—	—	—	14,512
Service	1,642	539	4,062	23,302	4,096	—	33,641
Electricity and natural gas	—	—	—	—	14,819	—	14,819
Total	58,992	50,363	24,940	23,302	18,915	—	176,512
Other revenue	3,632	95	4,459	55	1,181	68,682	78,104
	$62,624	$50,458	$29,399	$23,357	$20,096	$68,682	$254,616

2018	Manufacturing	McLane Company	Service and Retail	BNSF	Berkshire Hathaway Energy	Insurance, Corporate and other	Total
Manufactured products:							
Industrial and commercial products	$25,707	$ —	$ 204	$ —	$ —	$ —	$ 25,911
Building products	14,323	—	—	—	—	—	14,323
Consumer products	14,790	—	—	—	—	—	14,790
Grocery and convenience store distribution	—	33,518	—	—	—	—	33,518
Food and beverage distribution	—	16,309	—	—	—	—	16,309
Auto sales	—	—	8,181	—	—	—	8,181
Other retail and wholesale distribution	2,091	—	12,067	—	—	—	14,158
Service	1,519	84	4,100	23,652	3,949	—	33,304
Electricity and natural gas	—	—	—	—	14,951	—	14,951
Total	58,430	49,911	24,552	23,652	18,900	—	175,445
Other revenue	3,340	76	4,297	51	1,070	63,558	72,392
	$61,770	$49,987	$28,849	$23,703	$19,970	$63,558	$247,837

A summary of the transaction price allocated to the significant unsatisfied remaining performance obligations relating to contracts with expected durations in excess of one year as of December 31, 2019 follows (in millions).

	Performance obligations expected to be satisfied:		
	Less than 12 months	Greater than 12 months	Total
Electricity and natural gas	$ 871	$ 5,136	$ 6,007
Other sales and service contracts	1,158	2,562	3,720

(25) Pension plans

Several of our subsidiaries sponsor defined benefit pension plans covering certain employees. Benefits under the plans are generally based on years of service and compensation, although benefits under certain plans are based on years of service and fixed benefit rates. Our subsidiaries may make contributions to the plans to meet regulatory requirements and may also make discretionary contributions. The components of our net periodic pension expense for each of the three years ending December 31, 2019 were as follows (in millions).

	2019	2018	2017
Service cost	$ 224	$ 271	$ 273
Interest cost	618	593	635
Expected return on plan assets	(936)	(988)	(939)
Amortization of actuarial losses and other	26	188	157
Net periodic pension expense	$ (68)	$ 64	$ 126

The accumulated benefit obligation is the actuarial present value of benefits earned based on service and compensation prior to the valuation date. The projected benefit obligation ("PBO") is the actuarial present value of benefits earned based upon service and compensation prior to the valuation date and, if applicable, includes assumptions regarding future compensation levels. Benefit obligations under qualified U.S. defined benefit pension plans are funded through assets held in trusts. Pension obligations under certain non-U.S. plans and non-qualified U.S. plans are unfunded and the aggregate PBOs of such plans were approximately $1.3 billion and $1.2 billion as of December 31, 2019 and 2018, respectively.

Reconciliations of the changes in plan assets and PBOs related to BHE's pension plans and all other pension plans for each of the two years ending December 31, 2019 are in the following tables (in millions). The costs of pension plans covering employees of certain regulated subsidiaries of BHE are generally recoverable through the regulated rate making process.

	2019			2018		
	BHE	All other	Consolidated	BHE	All other	Consolidated
Benefit obligations						
Accumulated benefit obligation end of year	$ 4,653	$ 12,889	$ 17,542	$ 4,346	$ 11,540	$ 15,886
PBO beginning of year	$ 4,551	$ 12,371	$ 16,922	$ 5,207	$ 13,617	$ 18,824
Service cost	32	192	224	40	231	271
Interest cost	161	457	618	161	432	593
Benefits paid	(257)	(776)	(1,033)	(208)	(633)	(841)
Settlements	(121)	(46)	(167)	(301)	(133)	(434)
Actuarial (gains) or losses and other	532	1,610	2,142	(348)	(1,143)	(1,491)
PBO end of year	$ 4,898	$ 13,808	$ 18,706	$ 4,551	$ 12,371	$ 16,922
Plan assets						
Plan assets beginning of year	$ 4,385	$ 10,574	$ 14,959	$ 5,129	$ 11,885	$ 17,014
Employer contributions	68	131	199	98	495	593
Benefits paid	(257)	(776)	(1,033)	(208)	(633)	(841)
Actual return on plan assets	650	1,764	2,414	(191)	(949)	(1,140)
Settlements	(121)	(46)	(167)	(324)	(132)	(456)
Other	83	41	124	(119)	(92)	(211)
Plan assets end of year	$ 4,808	$ 11,688	$ 16,496	$ 4,385	$ 10,574	$ 14,959
Funded status – net liability	$ 90	$ 2,120	$ 2,210	$ 166	$ 1,797	$ 1,963

The funded status of our defined benefit pension plans at December 31, 2019 reflected in assets was $857 million and in liabilities was $3,067 million. At December 31, 2018, the funded status included in assets was $510 million and in liabilities was $2,473 million.

(25) Pension plans *(Continued)*

Weighted average assumptions used in determining PBOs and net periodic pension expense were as follows.

	2019	2018	2017
Discount rate applicable to pension benefit obligations	3.1%	3.9%	3.3%
Expected long-term rate of return on plan assets	6.4	6.4	6.4
Rate of compensation increase	2.5	2.6	2.8
Discount rate applicable to net periodic pension expense	4.0	3.4	3.9

Benefit payments expected over the next ten years are as follows (in millions): 2020 – $1,059; 2021 – $997; 2022 – $1,003; 2023 – $1,009; 2024 – $1,017; and 2025 to 2029 – $5,035. Sponsoring subsidiaries expect to contribute $191 million to defined benefit pension plans in 2020.

Fair value measurements of plan assets as of December 31, 2019 and 2018 follow (in millions).

	Fair Value				Investment funds and partnerships at net asset value
	Total	Level 1	Level 2	Level 3	
December 31, 2019					
Cash and cash equivalents	$ 412	$ 309	$ 103	$ —	$ —
Equity securities	11,105	9,860	836	409	—
Government obligations	1,537	1,433	104	—	—
Other fixed maturity securities	791	160	600	31	—
Investment funds and other	2,651	143	358	40	2,110
	$ 16,496	$ 11,905	$ 2,001	$ 480	$ 2,110
December 31, 2018					
Cash and cash equivalents	$ 1,328	$ 1,197	$ 131	$ —	$ —
Equity securities	7,671	7,499	22	150	—
Government obligations	1,727	1,654	73	—	—
Other fixed maturity securities	836	172	631	33	—
Investment funds and other	3,397	170	1,042	273	1,912
	$ 14,959	$ 10,692	$ 1,899	$ 456	$ 1,912

Refer to Note 20 for a discussion of the three levels in the hierarchy of fair values. Plan assets are generally invested with the long-term objective of producing earnings to adequately cover expected benefit obligations, while assuming a prudent level of risk. Allocations may change as a result of changing market conditions and investment opportunities. The expected rates of return on plan assets reflect subjective assessments of expected invested asset returns over a period of several years. Generally, past investment returns are not given significant consideration when establishing assumptions for expected long-term rates of return on plan assets. Actual experience will differ from the assumed rates.

A reconciliation of the pre-tax accumulated other comprehensive income (loss) related to defined benefit pension plans for each of the two years ending December 31, 2019 follows (in millions).

	2019	2018
Balance beginning of year	$ (1,184)	$ (614)
Amount included in net periodic pension expense	94	116
Actuarial gains (losses) and other	(806)	(686)
Balance end of year	$ (1,896)	$ (1,184)

Several of our subsidiaries also sponsor defined contribution retirement plans, such as 401(k) or profit-sharing plans. Employee contributions are subject to regulatory limitations and the specific plan provisions. Several plans provide for employer matching contributions up to levels specified in the plans and provide for additional discretionary contributions as determined by management. Employer contributions expensed with respect to our defined contribution plans were $1,233 million in 2019, $1,009 million in 2018 and $1,001 million in 2017.

(26) Contingencies and Commitments

We are parties in a variety of legal actions that routinely arise out of the normal course of business, including legal actions seeking to establish liability directly through insurance contracts or indirectly through reinsurance contracts issued by Berkshire subsidiaries. Plaintiffs occasionally seek punitive or exemplary damages. We do not believe that such normal and routine litigation will have a material effect on our financial condition or results of operations. Berkshire and certain of its subsidiaries are also involved in other kinds of legal actions, some of which assert or may assert claims or seek to impose fines and penalties. We believe that any liability that may arise as a result of other pending legal actions will not have a material effect on our consolidated financial condition or results of operations.

Our subsidiaries regularly make commitments in the ordinary course of business to purchase goods and services used in their businesses. As of December 31, 2019, estimated future payments under such arrangements were as follows: $15.7 billion in 2020, $5.6 billion in 2021, $3.7 billion in 2022, $2.8 billion in 2023, $2.6 billion in 2024 and $19.7 billion after 2024. The most significant of these relate to our railroad, utilities and energy businesses and our fractional aircraft ownership business.

Pursuant to the terms of agreements with noncontrolling shareholders in our less than wholly-owned subsidiaries, we may be obligated to acquire their equity interests. If we had acquired all outstanding noncontrolling interests as of December 31, 2019, we estimate the cost would have been approximately $5.4 billion. However, the timing and the amount of any such future payments that might be required are contingent on future actions of the noncontrolling owners.

(27) Business segment data

Our operating businesses include a large and diverse group of insurance, manufacturing, service and retailing businesses. We organize our reportable business segments in a manner that reflects how management views those business activities. Certain businesses are grouped together for segment reporting based upon similar products or product lines, marketing, selling and distribution characteristics, even though those business units are operated under separate local management.

The tabular information that follows shows data of reportable segments reconciled to amounts reflected in our Consolidated Financial Statements. Intersegment transactions are not eliminated from segment results when management considers those transactions in assessing the results of the respective segments. Furthermore, our management does not consider investment and derivative gains/losses, amortization of certain business acquisition accounting adjustments related to Berkshire's business acquisitions or certain other corporate income and expense items in assessing the financial performance of operating units. Collectively, these items are included in reconciliations of segment amounts to consolidated amounts.

Business Identity	**Business Activity**
Insurance:	
GEICO	Underwriting private passenger automobile insurance mainly by direct response methods
Berkshire Hathaway Primary Group	Underwriting multiple lines of property and casualty insurance policies for primarily commercial accounts
Berkshire Hathaway Reinsurance Group	Underwriting excess-of-loss, quota-share and facultative reinsurance worldwide
BNSF	Operation of one of the largest railroad systems in North America
Berkshire Hathaway Energy	Regulated electric and gas utility, including power generation and distribution activities and real estate brokerage activities
Manufacturing	Manufacturers of numerous products including industrial, consumer and building products, including manufactured housing and related consumer financing
McLane Company	Wholesale distribution of groceries and non-food items
Service and retailing	Providers of numerous services including fractional aircraft ownership programs, aviation pilot training, electronic

components distribution, various retailing businesses, including automobile dealerships, and trailer and furniture leasing

(27) Business segment data *(Continued)*

A disaggregation of our consolidated data for each of the three most recent years is presented as follows (in millions).

	Revenues			Earnings before income taxes		
	2019	2018	2017	2019	2018	2017
Operating Businesses:						
Insurance:						
Underwriting:						
GEICO	$ 35,572	$ 33,363	$ 29,441	$ 1,506	$ 2,449	$ (310)
Berkshire Hathaway Primary Group	9,165	8,111	7,143	383	670	719
Berkshire Hathaway Reinsurance Group	16,341	15,944	24,013	(1,472)	(1,109)	(3,648)
Insurance underwriting	61,078	57,418	60,597	417	2,010	(3,239)
Investment income	6,615	5,518	4,865	6,600	5,503	4,855
Total insurance	67,693	62,936	65,462	7,017	7,513	1,616
BNSF	23,515	23,855	21,387	7,250	6,863	6,328
Berkshire Hathaway Energy	20,114	19,987	18,854	2,618	2,472	2,499
Manufacturing	62,730	61,883	57,645	9,522	9,366	8,324
McLane Company	50,458	49,987	49,775	288	246	299
Service and retailing	29,487	28,939	27,219	2,555	2,696	2,304
	253,997	247,587	240,342	29,250	29,156	21,370
Reconciliation to consolidated amount:						
Investment and derivative gains/losses	—	—	—	72,607	(22,455)	2,128
Interest expense, not allocated to segments	—	—	—	(416)	(458)	(486)
Equity method investments	—	—	—	1,176	(2,167)	3,014
Corporate, eliminations and other	619	250	(409)	79	(75)	(2,188)
	$ 254,616	$ 247,837	$ 239,933	$ 102,696	$ 4,001	$ 23,838

	Interest expense			Income tax expense		
	2019	2018	2017	2019	2018	2017
Operating Businesses:						
Insurance	$ —	$ —	$ —	$ 1,166	$ 1,374	$ (71)
BNSF	1,070	1,041	1,016	1,769	1,644	2,369
Berkshire Hathaway Energy	1,835	1,777	2,254	(526)	(452)	148
Manufacturing	752	690	679	2,253	2,188	2,678
McLane Company	—	15	19	71	59	94
Service and retailing	86	91	67	603	634	812
	3,743	3,614	4,035	5,336	5,447	6,030
Reconciliation to consolidated amount:						
Investment and derivative gains/losses	—	—	—	15,159	(4,673)	742
Interest expense, not allocated to segments	416	458	486	(88)	(96)	(170)
Equity method investments	—	—	—	148	(753)	910
Income tax net benefit – Tax Cuts and Jobs Act of 2017	—	—	—	—	—	(28,200)
Corporate, eliminations and other	(198)	(219)	(135)	349	(246)	(827)
	$ 3,961	$ 3,853	$ 4,386	$ 20,904	$ (321)	$ (21,515)

(27) Business segment data *(Continued)*

	Capital expenditures			Depreciation of tangible assets		
	2019	2018	2017	2019	2018	2017
Operating Businesses:						
Insurance	$ 108	$ 130	$ 170	$ 82	$ 79	$ 84
BNSF	3,608	3,187	3,256	2,350	2,268	2,304
Berkshire Hathaway Energy	7,364	6,241	4,571	2,947	2,830	2,548
Manufacturing	2,981	3,116	2,490	1,951	1,890	1,839
McLane Company	158	276	289	225	204	193
Service and retailing	1,760	1,587	932	1,192	1,115	751
	$ 15,979	$ 14,537	$ 11,708	$ 8,747	$ 8,386	$ 7,719

	Goodwill at year-end			Identifiable assets at year-end		
	2019	2018	2017	2019	2018	2017
Operating Businesses:						
Insurance	$ 15,289	$ 15,289	$ 15,499	$364,550	$289,746	$294,418
BNSF	14,851	14,851	14,845	73,699	70,242	69,438
Berkshire Hathaway Energy	9,979	9,851	9,935	88,651	80,543	77,710
Manufacturing	34,800	34,019	33,967	104,437	99,912	97,753
McLane Company	734	734	734	6,872	6,243	6,090
Service and retailing	6,229	6,281	6,278	26,494	24,724	20,014
	$ 81,882	$ 81,025	$ 81,258	664,703	571,410	565,423
Reconciliation to consolidated amount:						
Corporate and other				71,144	55,359	55,414
Goodwill				81,882	81,025	81,258
				$817,729	$707,794	$702,095

Property/casualty and life/health insurance premiums written and earned are summarized below (in millions).

	Property/Casualty			Life/Health		
	2019	2018	2017	2019	2018	2017
Premiums Written:						
Direct	$ 47,578	$ 44,513	$ 39,377	$ 839	$ 1,111	$ 866
Assumed	10,214	8,970	17,815	5,046	5,540	4,925
Ceded	(821)	(869)	(694)	(45)	(49)	(47)
	$ 56,971	$ 52,614	$ 56,498	$ 5,840	$ 6,602	$ 5,744
Premiums Earned:						
Direct	$ 46,540	$ 43,095	$ 37,755	$ 839	$ 1,111	$ 866
Assumed	9,643	8,649	17,813	4,952	5,438	4,866
Ceded	(851)	(825)	(677)	(45)	(50)	(26)
	$ 55,332	$ 50,919	$ 54,891	$ 5,746	$ 6,499	$ 5,706

Insurance premiums written by geographic region (based upon the domicile of the insured or reinsured) are summarized below (in millions).

	Property/Casualty			Life/Health		
	2019	2018	2017	2019	2018	2017
United States	$ 50,529	$ 46,146	$ 50,604	$ 2,553	$ 3,598	$ 3,320
Asia Pacific	3,114	3,726	3,307	1,582	1,361	879
Western Europe	2,535	2,157	1,516	908	939	909
All other	793	585	1,071	797	704	636
	$ 56,971	$ 52,614	$ 56,498	$ 5,840	$ 6,602	$ 5,744

(27) Business segment data *(Continued)*

Consolidated sales, service and leasing revenues were $140.8 billion in 2019, $139.1 billion in 2018 and $132.8 billion in 2017. In 2019, 85% of such revenues were attributable to the United States compared to 84% in 2018 and 85% in 2017. The remainder of sales, service and leasing revenues were primarily in Europe, Canada and the Asia Pacific. In 2019 and 2018, approximately 96% of our revenues from railroad, utilities and energy businesses were in the United States compared to 95% in 2017. At December 31, 2019, approximately 89% of our consolidated net property, plant and equipment and equipment held for lease was located in the United States with the remainder primarily in Canada and Europe.

(28) Quarterly data

A summary of revenues and net earnings by quarter for each of the last two years follows. This information is unaudited. Amounts are in millions, except per share amounts.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2019				
Revenues	$ 60,678	$ 63,598	$ 64,972	$ 65,368
Net earnings (loss) attributable to Berkshire shareholders *	21,661	14,073	16,524	29,159
Net earnings (loss) attributable to Berkshire shareholders per equivalent Class A common share	13,209	8,608	10,119	17,909
2018				
Revenues	$ 58,473	$ 62,200	$ 63,450	$ 63,714
Net earnings (loss) attributable to Berkshire shareholders *	(1,138)	12,011	18,540	(25,392)
Net earnings (loss) attributable to Berkshire shareholders per equivalent Class A common share	(692)	7,301	11,280	(15,467)

* *Includes after-tax investment and derivative gains/losses as follows:*

	1st Quarter	*2nd Quarter*	*3rd Quarter*	*4th Quarter*
2019	*$ 16,106*	*$ 7,934*	*$ 8,666*	*$ 24,739*
2018	*(6,426)*	*5,118*	*11,660*	*(28,089)*

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None

Item 9A. Controls and Procedures

At the end of the period covered by this Annual Report on Form 10-K, the Corporation carried out an evaluation, under the supervision and with the participation of the Corporation's management, including the Chairman (Chief Executive Officer) and the Senior Vice President (Chief Financial Officer), of the effectiveness of the design and operation of the Corporation's disclosure controls and procedures pursuant to Exchange Act Rule 13a-15. Based upon that evaluation, the Chairman (Chief Executive Officer) and the Senior Vice President (Chief Financial Officer) concluded that the Corporation's disclosure controls and procedures are effective in timely alerting them to material information relating to the Corporation (including its consolidated subsidiaries) required to be included in the Corporation's periodic SEC filings. The report called for by Item 308(a) of Regulation S-K is incorporated herein by reference to Management's Report on Internal Control Over Financial Reporting, included on page K-62 of this report. The attestation report called for by Item 308(b) of Regulation S-K is incorporated herein by reference to Report of Independent Registered Public Accounting Firm, included on page K-63 of this report. There has been no change in the Corporation's internal control over financial reporting during the quarter ended December 31, 2019 that has materially affected, or is reasonably likely to materially affect, the Corporation's internal control over financial reporting.

Item 9B. Other Information

None

Part III

Except for the information set forth under the caption "Executive Officers of the Registrant" in Part I hereof, information required by this Part (Items 10, 11, 12, 13 and 14) is incorporated by reference from the Registrant's definitive proxy statement, filed pursuant to Regulation 14A, for the Annual Meeting of Shareholders of the Registrant to be held on May 2, 2020, which meeting will involve the election of directors.

Part IV

Item 15. Exhibits and Financial Statement Schedules

(a)1. *Financial Statements*

The following Consolidated Financial Statements, as well as the Report of Independent Registered Public Accounting Firm, are included in Part II Item 8 of this report:

2. *Financial Statement Schedule*

Other schedules are omitted because they are not required, information therein is not applicable, or is reflected in the Consolidated Financial Statements or notes thereto.

(b) *Exhibits*

See the "Exhibit Index" at page K-116.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of
Berkshire Hathaway Inc.
Omaha, Nebraska

Opinion on the Financial Statement Schedule

We have audited the consolidated financial statements of Berkshire Hathaway Inc. and subsidiaries (the "Company") as of December 31, 2019 and 2018, and for each of the three years in the period ended December 31, 2019, and the Company's internal control over financial reporting as of December 31, 2019, and have issued our report thereon dated February 22, 2020; such consolidated financial statements and report are included elsewhere in this Form 10-K. Our audits also included the financial statement schedule of the Company listed in the Index at Item 15. This financial statement schedule is the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statement schedule based on our audits. In our opinion, such financial statement schedule, when considered in relation to the financial statements taken as a whole, presents fairly, in all material respects, the information set forth therein.

Change in Accounting Principle

As discussed in Note 1 to the financial statements of the Company, the Company has changed its method of accounting for investments in equity securities (excluding equity method investments) in 2018 due to the adoption of ASU 2016-01 "Financial Instruments – Recognition and Measurement of Financial Assets and Financial Liabilities."

/s/ Deloitte & Touche LLP
Omaha, Nebraska
February 22, 2020

BERKSHIRE HATHAWAY INC. (Parent Company)
Condensed Financial Information
(Dollars in millions)
Schedule I
Balance Sheets

	December 31,	
	2019	**2018**
Assets:		
Cash and cash equivalents	$ 15,004	$ 3,437
Short-term investments in U.S. Treasury Bills	25,514	22,957
Investments in and advances to/from consolidated subsidiaries	392,162	328,898
Investment in The Kraft Heinz Company	13,757	13,813
Other assets	131	80
	$ 446,568	$ 369,185
Liabilities and Shareholders' Equity:		
Accounts payable, accrued interest and other liabilities	$ 320	$ 1,507
Income taxes, principally deferred	1,554	2,104
Notes payable and other borrowings	19,903	16,871
	21,777	20,482
Berkshire Hathaway shareholders' equity	424,791	348,703
	$ 446,568	$ 369,185

Statements of Earnings and Comprehensive Income

	Year ended December 31,		
	2019	**2018**	**2017**
Income items:			
From consolidated subsidiaries:			
Dividends and distributions	$ 15,603	$ 9,658	$ 5,367
Undistributed earnings (losses)	65,237	(3,952)	37,832
	80,840	5,706	43,199
Investment gains (losses)	(125)	(4)	(1)
Equity in net earnings (losses) of The Kraft Heinz Company	493	(2,730)	2,938
Other income	780	649	350
	81,988	3,621	46,486
Cost and expense items:			
General and administrative	122	216	159
Interest expense	591	601	522
Foreign exchange (gains) losses on non-U.S. Dollar denominated debt	(193)	(366)	1,008
Income tax expense (benefit)	51	(851)	(143)
	571	(400)	1,546
Net earnings attributable to Berkshire Hathaway shareholders	81,417	4,021	44,940
Other comprehensive income attributable to Berkshire Hathaway shareholders	(228)	(2,211)	21,273
Comprehensive income attributable to Berkshire Hathaway shareholders	$ 81,189	$ 1,810	$ 66,213

See Note to Condensed Financial Information

BERKSHIRE HATHAWAY INC. (Parent Company)
Condensed Financial Information
(Dollars in millions)
Schedule I (continued)
Statements of Cash Flows

	Year ended December 31,		
	2019	2018	2017
Cash flows from operating activities:			
Net earnings attributable to Berkshire Hathaway shareholders	$ 81,417	$ 4,021	$ 44,940
Adjustments to reconcile net earnings to cash flows from operating activities:			
Investment gains/losses	125	4	1
Undistributed earnings of consolidated subsidiaries	(65,237)	3,952	(37,832)
Income taxes payable	(56)	(972)	(135)
Other	(693)	3,062	(1,234)
Net cash flows from operating activities	15,556	10,067	5,740
Cash flows from investing activities:			
Investments in and advances to/from consolidated subsidiaries, net	60	460	(239)
Purchases of U.S. Treasury Bills	(40,107)	(29,740)	(19,663)
Sales and maturities of U.S. Treasury Bills	36,943	21,442	14,847
Other	737	—	—
Net cash flows from investing activities	(2,367)	(7,838)	(5,055)
Cash flows from financing activities:			
Proceeds from borrowings	3,967	17	1,201
Repayments of borrowings	(758)	(1,563)	(1,145)
Acquisition of treasury stock	(4,850)	(1,346)	—
Other	19	61	77
Net cash flows from financing activities	(1,622)	(2,831)	133
Increase (decrease) in cash and cash equivalents	11,567	(602)	818
Cash and cash equivalents at beginning of year	3,437	4,039	3,221
Cash and cash equivalents at end of year	$ 15,004	$ 3,437	$ 4,039
Other cash flow information:			
Income taxes paid	$ 3,531	$ 2,790	$ 2,076
Interest paid	364	388	386

Note to Condensed Financial Information

Berkshire acquired 50% of the outstanding common stock of Heinz Holding Company in 2013. After a series of transactions in 2015, that interest represented 26.8% of the outstanding common stock of The Kraft Heinz Company ("Kraft Heinz"). Berkshire currently owns 26.6% of the outstanding shares of Kraft Heinz common stock. Reference is made to Note 5 to the accompanying Consolidated Financial Statements for additional information.

In 2019, the Parent Company issued ¥430.0 billion of senior notes with various maturities and interest rates. See Note 17 to the accompanying Consolidated Financial Statements for additional information. For each of the three years ending December 31, 2019, Parent Company borrowings also included €6.85 billion senior notes. The gains and losses from the periodic remeasurement of these non-U.S. Dollar denominated notes due to changes in foreign currency exchange rates are included in earnings.

Parent Company debt maturities over the next five years are as follows: 2020—$1,122 million; 2021—$2,117 million; 2022—$613 million; 2023—$3,958 million and 2024—$2,120 million. At December 31, 2019, Parent Company guarantees of debt obligations of certain of its subsidiaries were approximately $12.2 billion. Such guarantees are an absolute, unconditional and irrevocable guarantee for the full and prompt payment when due of all present and future payment obligations. Parent Company has also provided guarantees in connection with equity index put option contracts and certain retroactive reinsurance contracts of subsidiaries. The amounts of subsidiary payments under these contracts, if any, is contingent upon the outcome of future events.

In December 2017, the Tax Cuts and Jobs Act of 2017 ("TCJA") was enacted, which reduced the Parent Company's income tax expense in 2017 by $550 million, primarily due to the reduction in deferred tax liabilities attributable to the lower U.S. statutory rate, partly offset by a one-time income tax expense on certain accumulated undistributed earnings of foreign subsidiaries. The effects of the TCJA on income tax expense of consolidated subsidiaries is included in undistributed earnings in consolidated subsidiaries.

EXHIBIT INDEX

Exhibit No.	
2(i)	Agreement and Plan of Merger dated as of June 19, 1998 between Berkshire and General Re Corporation. Incorporated by reference to Annex I to Registration Statement No. 333-61129 filed on Form S-4.
2(ii)	Agreement and Plan of Merger dated as of November 2, 2009 by and among Berkshire, R Acquisition Company, LLC and BNSF. Incorporated by reference to Annex A to Registration Statement No. 333-163343 on Form S-4.
2(iii)	Agreement and Plan of Merger dated August 8, 2015, by and among Berkshire, NW Merger Sub Inc. and Precision Castparts Corporation (“PCC”) Incorporated by reference to Exhibit 2.1 to PCC’s Current Report on Form 8-K filed on August 10, 2015 (SEC File No. 001-10348)
3(i)	Restated Certificate of Incorporation Incorporated by reference to Exhibit 3(i) to Form 10-K filed on March 2, 2015.
3(ii)	By-Laws Incorporated by reference to Exhibit 3(ii) to Form 8-K filed on May 4, 2016.
4.1	Indenture, dated as of December 22, 2003, between Berkshire Hathaway Finance Corporation, Berkshire Hathaway Inc. and The Bank of New York Mellon Trust Company, N.A. (as successor to J.P. Morgan Trust Company, National Association), as trustee. Incorporated by reference to Exhibit 4.1 on Form S-4 of Berkshire Hathaway Finance Corporation and Berkshire Hathaway Inc. filed on February 4, 2004. SEC File No. 333-112486
4.2	Indenture, dated as of February 1, 2010, among Berkshire Hathaway Inc., Berkshire Hathaway Finance Corporation and The Bank of New York Mellon Trust Company, N.A., as trustee. Incorporated by reference to Exhibit 4.1 to Berkshire’s Registration Statement on Form S-3 filed on February 1, 2010. SEC File No. 333-164611
4.3	Indenture, dated as of January 26, 2016, by and among Berkshire Hathaway Inc., Berkshire Hathaway Finance Corporation and The Bank of New York Mellon Trust Company, N.A., as trustee. Incorporated by reference to Exhibit 4.1 to Berkshire’s Registration Statement on Form S-3 filed on January 26, 2016. SEC File No. 333-209122
4.4	Indenture, dated as of December 1, 1995, between BNSF and The First National Bank of Chicago, as trustee. Incorporated by reference to Exhibit 4 on Form S-3 of BNSF filed on February 8, 1999.
4.5	Indenture, dated as of October 4, 2002, by and between MidAmerican Energy Holdings Company and The Bank of New York, Trustee. Incorporated by reference to Exhibit 4.1 to the Berkshire Hathaway Energy Company Registration Statement No. 333-101699 dated December 6, 2002.
	Other instruments defining the rights of holders of long-term debt of Registrant and its subsidiaries are not being filed since the total amount of securities authorized by all other such instruments does not exceed 10% of the total assets of the Registrant and its subsidiaries on a consolidated basis as of December 31, 2019. The Registrant hereby agrees to furnish to the Commission upon request a copy of any such debt instrument to which it is a party.
10.1	Equity Commitment Letter of Berkshire Hathaway Inc. with Hawk Acquisition Holding Corporation dated February 13, 2013. Incorporated by reference to Exhibit 10.1 on Form 8-K of Berkshire Hathaway Inc. filed on February 14, 2013.
14	Code of Ethics Berkshire’s Code of Business Conduct and Ethics is posted on its Internet website at *www.berkshirehathaway.com*
21	Subsidiaries of Registrant
23	Consent of Independent Registered Public Accounting Firm
31.1	Rule 13a—14(a)/15d-14(a) Certification
31.2	Rule 13a—14(a)/15d-14(a) Certification
32.1	Section 1350 Certification
32.2	Section 1350 Certification
95	Mine Safety Disclosures

Exhibit No.	
101	The following financial information from Berkshire Hathaway Inc.'s Annual Report on Form 10-K for the year ended December 31, 2019, formatted in iXBRL (Inline Extensible Business Reporting Language) includes: (i) the Cover Page (ii) the Consolidated Balance Sheets, (iii) the Consolidated Statements of Earnings, (iv) the Consolidated Statements of Comprehensive Income, (v) the Consolidated Statements of Changes in Shareholders' Equity, (vi) the Consolidated Statements of Cash Flows, and (vii) the Notes to Consolidated Financial Statements and Schedule I, tagged in summary and detail.
104	Cover Page Interactive Data File (formatted as iXBRL and contained in Exhibit 101)

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

BERKSHIRE HATHAWAY INC.

Date: February 22, 2020

/S/ MARC D. HAMBURG

Marc D. Hamburg
Senior Vice President and
Principal Financial Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

/s/ WARREN E. BUFFETT **Warren E. Buffett**	Chairman of the Board of Directors—Chief Executive Officer	February 22, 2020 Date
/s/ GREGORY E. ABEL **Gregory E. Abel**	Director—Vice Chairman—Non Insurance Operations	February 22, 2020 Date
/s/ HOWARD G. BUFFETT **Howard G. Buffett**	Director	February 22, 2020 Date
/s/ STEPHEN B. BURKE **Stephen B. Burke**	Director	February 22, 2020 Date
/s/ SUSAN L. DECKER **Susan L. Decker**	Director	February 22, 2020 Date
/s/ WILLIAM H. GATES III **William H. Gates III**	Director	February 22, 2020 Date
/s/ DAVID S. GOTTESMAN **David S. Gottesman**	Director	February 22, 2020 Date
/s/ CHARLOTTE GUYMAN **Charlotte Guyman**	Director	February 22, 2020 Date
/s/ AJIT JAIN **Ajit Jain**	Director—Vice Chairman—Insurance Operations	February 22, 2020 Date
/s/ CHARLES T. MUNGER **Charles T. Munger**	Director—Vice Chairman	February 22, 2020 Date
/s/ THOMAS S. MURPHY **Thomas S. Murphy**	Director	February 22, 2020 Date
/s/ RONALD L. OLSON **Ronald L. Olson**	Director	February 22, 2020 Date
/s/ WALTER SCOTT, JR. **Walter Scott, Jr.**	Director	February 22, 2020 Date
/s/ MERYL B. WITMER **Meryl B. Witmer**	Director	February 22, 2020 Date
/s/ MARC D. HAMBURG **Marc D. Hamburg**	Senior Vice President—Principal Financial Officer	February 22, 2020 Date
/s/ DANIEL J. JAKSICH **Daniel J. Jaksich**	Vice President—Principal Accounting Officer	February 22, 2020 Date

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

☑ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF

For the fiscal year ended December 31, 2018

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT O

For the transition period from ______ to ______

Commission file number 001-14905

BERKSHIRE HATHAWAY INC.

(Exact name of Registrant as specified in its charter)

Delaware State or other jurisdiction of incorporation or organization	**47-0813844** (I.R.S. Employer Identification Number)
3555 Farnam Street, Omaha, Nebraska (Address of principal executive office)	**68131** (Zip Code)

Registrant's telephone number, including area code (402) 346-1400
Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
Class A common stock, $5.00 Par Value	New York Stock Exchange
Class B common stock, $0.0033 Par Value	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: NONE

Indicate by check mark if the Registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes

Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes

Indicate by check mark whether the Registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Ex during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been sub requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted purs Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was require files). Yes ☑ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not co will not be contained, to the best of Registrant's knowledge, in definitive proxy or information statements incorporated by reference Form 10-K or any amendment to this Form 10-K. ☐

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller report emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "e company" in Rule 12b-2 of the Exchange Act. Large accelerated filer ☑ Accelerated filer ☐ Non-accelerated filer ☐ Smaller repo Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for co new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ N

State the aggregate market value of the voting stock held by non-affiliates of the Registrant as of June 30, 2018: $367,009,

Indicate the number of shares outstanding of each of the Registrant's classes of common stock:

February 14, 2019—Class A common stock, $5 par value	725,807 shares
February 14, 2019—Class B common stock, $0.0033 par value	1,372,751,831 shares

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Proxy Statement for the Registrant's Annual Meeting to be held May 4, 2019 are incorporated in Part

* This aggregate value is computed at the last sale price of the common stock as reported on the New York Stock Exchange on Jun not include the value of Class A common stock (294,660 shares) and Class B common stock (57,946,850 shares) held by Directo Officers of the Registrant and members of their immediate families, some of whom may not constitute "affiliates" for purpose Exchange Act of 1934.

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Part I

Item 1. Business Description

Berkshire Hathaway Inc. ("Berkshire," "Company" or "Registrant") is a holding company owning subsidiaries engaged in a business activities. The most important of these are insurance businesses conducted on both a primary basis and a reinsurance bas transportation business and a group of utility and energy generation and distribution businesses. Berkshire also owns and operates other businesses engaged in a variety of activities, as identified herein. Berkshire is domiciled in the state of Delaware, and its corp are located in Omaha, Nebraska.

Berkshire's operating businesses are managed on an unusually decentralized basis. There are essentially no centralized or i functions (such as sales, marketing, purchasing, legal or human resources) and there is minimal involvement by Berkshire's corpora the day-to-day business activities of the operating businesses. Berkshire's corporate senior management team participates in an responsible for significant capital allocation decisions, investment activities and the selection of the Chief Executive to head each businesses. It also is responsible for establishing and monitoring Berkshire's corporate governance practices, including, but n communicating the appropriate "tone at the top" messages to its employees and associates, monitoring governance efforts, includ operating businesses, and participating in the resolution of governance-related issues as needed.

Berkshire and its consolidated subsidiaries employ approximately 389,000 people worldwide.

Insurance and Reinsurance Businesses

Berkshire's insurance and reinsurance business activities are conducted through numerous domestic and foreign-based in Berkshire's insurance businesses provide insurance and reinsurance of property and casualty and life, accident and health risk

In direct or primary insurance activities, the insurer assumes the risk of loss from persons or organizations that are directly s Such risks may relate to property, casualty (or liability), life, accident, health, financial or other perils that may arise from an ins reinsurance activities, the reinsurer assumes defined portions of risks that other direct insurers or reinsurers assumed in their own i

Reinsurance contracts are normally classified as treaty or facultative contracts. Treaty reinsurance refers to reinsurance co portion of a specified group or class of risks ceded by the direct insurer, while facultative reinsurance involves coverage of spe underlying risks. Reinsurance contracts are further classified as quota-share or excess. Under quota-share (proportional or pro-rata reinsurer shares proportionally in the original premiums and losses of the direct insurer or reinsurer. Excess (or non-proportional) re for the indemnification of the direct insurer or reinsurer for all or a portion of the loss in excess of an agreed upon amount or "reten share and excess reinsurance contracts may provide for aggregate limits of indemnification.

Insurance and reinsurance are generally subject to regulatory oversight throughout the world. Except for regulatory conside virtually no barriers to entry into the insurance and reinsurance industry. Competitors may be domestic or foreign, as well as licensed number of competitors within the industry is not known. Insurers and reinsurers compete on the basis of reliability, financial stren financial ratings, underwriting consistency, service, business ethics, price, performance, capacity, policy terms and coverage

Insurers based in the United States ("U.S.") are subject to regulation by their states of domicile and by those states in which t write policies on an admitted basis. The primary focus of regulation is to assure that insurers are financially solvent and that policyh otherwise protected. States establish minimum capital levels for insurance companies and establish guidelines for permissible busin activities. States have the authority to suspend or revoke a company's authority to do business as conditions warrant. States regula dividends by insurance companies to their shareholders and other transactions with affiliates. Dividends, capital distributions and o extraordinary amounts are subject to prior regulatory approval.

Insurers may market, sell and service insurance policies in the states where they are licensed. These insurers are referred to a Admitted insurers are generally required to obtain regulatory approval of their policy forms and premium rates. Non-admitted insur developed to provide insurance that is otherwise unavailable through admitted insurers. Non-admitted insurance, often referred t surplus" lines, is procured by either state-licensed surplus lines brokers who place risks with insurers not licensed in that state or by direct procurement from non-admitted insurers. Non-admitted insurance is subject to considerably less regulation with respect to pol Reinsurers are normally not required to obtain regulatory approval of premium rates or reinsurance contracts.

The insurance regulators of every state participate in the National Association of Insurance Commissioners ("NAIC"). The N instructions and accounting procedures for use by U.S. insurers and reinsurers in preparing and filing annual statutory financial stater insurer's state of domicile has ultimate authority over these matters. In addition to its activities relating to the annual statement, the adopts statutory accounting principles, model laws, regulations and programs for use by its members. Such matters deal with regula solvency, risk management, compliance with financial regulation standards and risk-based capital reporting requireme

Berkshire's insurance companies maintain capital strength at exceptionally high levels, which differentiates them from th Collectively, the combined statutory surplus of Berkshire's U.S. based insurers was approximately $162 billion at December 31, 2018 insurance subsidiaries are rated AA+ by Standard & Poor's and A++ (superior) by A.M. Best with respect to their financial condition ability.

The Terrorism Risk Insurance Act of 2002 established within the Department of the Treasury a Terrorism Insurance Progran commercial property and casualty insurers by providing federal reinsurance of insured terrorism losses. The Program currently exten 2020 through other Acts, most recently the Terrorism Risk Insurance Program Reauthorization Act of 2015 (the "2015 TRIA Rea Hereinafter these Acts are collectively referred to as TRIA. Under TRIA, the Department of the Treasury is charged with certifying " Coverage under TRIA occurs if the industry insured loss for certified events occurring during the calendar year exceeds $180 mill $200 million in 2020, or any calendar year thereafter.

To be eligible for federal reinsurance, insurers must make available insurance coverage for acts of terrorism, by providing p clear and conspicuous notice of the amount of premium that will be charged for this coverage and of the federal share of any insure from any act of terrorism. Assumed reinsurance is specifically excluded from TRIA participation. TRIA currently also excludes cert insurance (such as personal and commercial auto, burglary, theft, surety and certain professional liability lines). Reinsurers are not terrorism coverage and are not eligible for federal reinsurance of terrorism losses.

During 2019, in the event of a certified act of terrorism, the federal government will reimburse insurers (conditioned on the policyholder notification requirements) for 81% of their insured losses in excess of an insurance group's deductible. Under the Reauthorization, the federal government's reimbursement obligation will be reduced to 80% in 2020 and thereafter. Under the Progra 20% of the aggregate direct subject earned premium for relevant commercial lines of business in the immediately preceding cale aggregate deductible in 2019 for Berkshire's insurance group is expected to approximate $1.3 billion. There is also an aggregate limi the amount of the federal government coverage for each TRIA year.

Regulation of the insurance industry outside of the United States is subject to the laws and regulations of each country in wh operations or writes premiums. Some jurisdictions impose comprehensive regulatory requirements on insurance businesses, such Kingdom, where insurers are subject to regulation by the Prudential Regulation Authority and the Financial Conduct Authority in insurers are subject to regulation by the Federal Financial Supervisory Authority (BaFin) and in Australia where insurers are subject Australian Prudential Regulatory Authority. Other jurisdictions may impose fewer requirements. In certain foreign countries, reinsure to be licensed by governmental authorities. These licenses may be subject to modification, suspension or revocation dependent or amount and types of insurance liabilities and minimum capital and solvency tests. The violation of regulatory requirements may resu and/or criminal sanctions in various jurisdictions.

Berkshire's insurance underwriting operations include the following groups: (1) GEICO, (2) Berkshire Hathaway Reinsur (3) Berkshire Hathaway Primary Group. Except for retroactive reinsurance and periodic payment annuity products that generate sign up-front premiums along with estimated claims expected to be paid over very long periods of time (creating "float," see Investmen Berkshire expects to achieve a net underwriting profit over time and to reject inadequately priced risks. Underwriting profit is de premiums less associated incurred losses, loss adjustment expenses and underwriting and policy acquisition expenses. Underwritin include investment income earned from investments. Berkshire's insurance businesses employ approximately 49,000 people. Addit related to each of Berkshire's underwriting groups follows.

GEICO—GEICO is headquartered in Chevy Chase, Maryland. GEICO's insurance subsidiaries consist of Government Em Company, GEICO General Insurance Company, GEICO Indemnity Company, GEICO Casualty Company, GEICO Advantage Insu GEICO Choice Insurance Company, GEICO Secure Insurance Company, GEICO County Mutual Insurance Company and GEICO Company. GEICO companies primarily offer private passenger automobile insurance to individuals in all 50 states and the District of also insures motorcycles, all-terrain vehicles, recreational vehicles, boats and small commercial fleets and acts as an agent for other homeowners, renters, boat, life and identity management insurance to individuals who desire insurance coverages other than those c GEICO's marketing is primarily through direct response methods in which applications for insurance are submitted directly to the c Internet or by telephone. GEICO conducts business through regional service centers and claims adjustment and other facilities

The automobile insurance business is highly competitive in the areas of price and service. GEICO competes for private pass insurance customers in the preferred, standard and non-standard risk markets with other companies that sell directly to the custome companies that use agency sales forces, including State Farm, Allstate (including Esurance), Progressive and USAA. Significant adv and competitive rates contributed to a cumulative increase in voluntary policies-in-force of approximately 35% over the past five ye most recently published A.M. Best data for 2017, the five largest automobile insurers had a combined market share in 2017 of approx GEICO's market share being second largest at approximately 12.8%. Since the publication of that data, GEICO's management esti market share is approximately 13.3%. Seasonal variations in GEICO's insurance business are not significant. However, extraordinary or other factors may have a significant effect upon the frequency or severity of automobile claims.

State insurance departments stringently regulate private passenger auto insurance. As a result, it is difficult for insurance differentiate their products. Competition for private passenger automobile insurance, which is substantial, tends to focus on price anc service provided. GEICO's cost-efficient direct response marketing methods and emphasis on customer satisfaction enable it to offe and value to its customers. GEICO primarily uses its own claims staff to manage and settle claims. The name and reputation of GE asset and management protects it and other service marks through appropriate registrations.

Berkshire Hathaway Reinsurance Group—Berkshire's combined global reinsurance business, referred to as the Berks Reinsurance Group ("BHRG"), offers a wide range of coverages on property, casualty, life and health risks to insurers and reinsu Reinsurance business is written through National Indemnity Company ("NICO"), domiciled in Nebraska, its subsidiaries and variou subsidiaries wholly owned by Berkshire (collectively, the "NICO Group") and General Re Corporation, domiciled in Delaware, an (collectively the "General Re Group"). BHRG's underwriting operations in the U.S. are based in Stamford, Connecticut. BHRG also activities globally in 23 countries.

The type and volume of business written is dependent on market conditions, including prevailing premium rates and coverag of underwriting activities often fluctuates significantly from year to year depending on the perceived level of price adequacy in spec reinsurance markets as well as from the timing of particularly large reinsurance transactions.

Property/casualty

The NICO Group offers traditional property/casualty reinsurance on both an excess-of-loss and a quota-share basis, catastro treaty and facultative reinsurance, and primary insurance on an excess-of-loss basis for large or unusual risks for clients worldwide. periodically participates in underwriting placements with major brokers in the London Market through Berkshire Hathaway Insura Ltd., based in Great Britain. Business is written through intermediary brokers or directly with the insured or reinsured. NICO also o retroactive reinsurance contracts, which cover past loss events arising from property and casualty contracts written by ceding insure

The type and volume of business written by the NICO Group may vary significantly from period to period resulting from ch premium rate adequacy and from unique or large transactions. A significant portion of NICO Group's annual reinsurance premium derives from a 10-year, 20% quota-share agreement with Insurance Australia Group Limited ("IAG") that became effective July 1, 20 line insurer in Australia, New Zealand and other Asia Pacific countries.

The General Re Group conducts a global property and casualty reinsurance business. Reinsurance contracts are written on b and excess basis for multiple lines of business. Contracts are primarily in the form of treaties, and to a lesser degree, on a facu

General Re Group conducts business in North America primarily through General Reinsurance Corporation ("GRC"), which District of Columbia and all states, except Hawaii, where it is an accredited reinsurer. GRC conducts operations in North America fro in Stamford, Connecticut and through 13 branch offices in the U.S. and Canada.

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In North America, the General Re Group includes General Star National Insurance Company, General Star Indemnity Comp
Insurance Company, which offer a broad array of specialty and surplus lines and property, casualty and professional liability coverag
marketed through a select group of wholesale brokers, managing general underwriters and program administrators, and offer soluti
needs of public entity, commercial and captive customers.

General Re Group's international reinsurance business is conducted on a direct basis through General Reinsurance AG ("G
Cologne Germany, and through several other subsidiaries and branches in 23 countries. International business is also written through
Faraday, a wholly-owned subsidiary. Faraday owns the managing agent of Syndicate 435 at Lloyd's of London, and provides capacity
100% of the results of Syndicate 435.

Retroactive reinsurance

Retroactive reinsurance contracts indemnify ceding companies against the adverse development of claims arising from loss
already occurred under property and casualty policies issued in prior years. Coverages under such contracts are provided on an exc
stated retention) or for losses payable immediately after the inception of the contract. Contracts are normally subject to aggreg
indemnification and are occasionally exceptionally large in amount. Significant amounts of asbestos, environmental and latent injur
under these contracts.

For instance, in January 2017, NICO entered into a retroactive reinsurance agreement with various subsidiaries of American I
Inc. (collectively, "AIG"). Under the agreement, NICO agreed to indemnify AIG for 80% of up to $25 billion in excess of $25 billio
of losses and allocated loss adjustment expenses with respect to certain commercial insurance loss events occurring in years p

The concept of time-value-of-money is an important element in establishing retroactive reinsurance contract prices and te
payments may occur over decades. Normally, expected ultimate losses payable under these policies are expected to exceed premium
underwriting losses. Nevertheless, this business is written, in part, because of the large amounts of policyholder funds generated fo
economic benefit of which will be reflected through investment results in future periods.

Life/health

The General Re Group also conducts a global life and health reinsurance business. In the U.S. and internationally, the Genera
life, disability, supplemental health, critical illness and long-term care coverages. The life/health business is marketed on a direct b
General Re Group wrote approximately 29% of life/health net premiums in the United States, 20% in Western Europe and the re
throughout the rest of the world.

Additionally, Berkshire Hathaway Life Insurance Company of Nebraska ("BHLN"), a subsidiary of NICO, writes reinsuranc
forms of traditional life insurance exposures. BHLN and its affiliates have also periodically reinsured certain guaranteed minimum d
similar benefit coverages on closed-blocks of variable annuity reinsurance contracts.

Periodic payment annuity

BHLN writes periodic payment annuity insurance policies and reinsures existing annuity-like obligations. Under these polici
upfront premiums and agrees in the future to make periodic payments that often extend for decades. These policies, generally relate t
underlying personal injury or workers' compensation cases of other insurers, known as structured settlements. Similar to retroact
contracts, time-value-of-money concepts are an important factor in establishing such premiums and underwriting losses are expected
accretion of time-value discounted liabilities.

Berkshire Hathaway Primary Group—The Berkshire Hathaway Primary Group ("BH Primary") is a collection of indepe
primary insurers that provide a wide variety of insurance coverages to policyholders located principally in the United States. These
are discussed below.

NICO and certain affiliates ("NICO Primary") underwrite commercial motor vehicle and general liability insurance on an adr
an excess and surplus basis. Insurance coverages are offered nationwide primarily through insurance agents and brok

The "Berkshire Hathaway Homestate Companies" ("BHHC") is a group of insurers offering workers' compensation, comr
commercial property coverages to a diverse client base. BHHC has developed a national reach, with the ability to provide first-dollar
deductible workers' compensation coverage to employers in all states, except those where coverage is available only through state-
compensation funds. NICO Primary and BHHC are each based in Omaha, Nebraska.

Berkshire Hathaway Specialty Insurance ("BH Specialty") provides commercial property, casualty, healthcare professional l and professional lines, surety, travel, medical stop loss and homeowners insurance. BH Specialty writes business on both an excess basis and an admitted basis in the U.S., and on a locally admitted basis outside the U.S. BH Specialty is based in Boston, Massachus offices currently in several cities in the U.S. and international offices located in Australia, New Zealand, Canada and several coun Europe. BH Specialty currently intends to further expand its operations. BH Specialty writes business through wholesale and retail in well as managing general agents.

MedPro Group ("MedPro") is a leading provider of customized healthcare liability insurance, claims, patient safety and r physicians, surgeons, dentists and other healthcare professionals, as well as hospitals, senior care and other healthcare facilities in t MedPro has provided insurance coverage to protect healthcare providers against losses since 1899. MedPro distributes policies pri nationwide network of appointed agents and brokers. MedPro currently offers coverage options to healthcare providers in the other c student health insurance, through its subsidiaries and other Berkshire affiliates. MedPro is based in Fort Wayne, India

U.S. Investment Corporation ("USIC") and its subsidiaries are specialty insurers that underwrite commercial, professional a insurance on an admitted basis, as well as an excess and surplus basis. USIC markets policies in all 50 states and the District of Co wholesale and retail insurance agents. USIC companies also underwrite and market a wide variety of specialty insurance products. Wayne, Pennsylvania.

Applied Underwriters, Inc. ("Applied") is a provider of payroll and insurance services to small and mid-sized employers. Ap subsidiaries principally markets a product that bundles workers' compensation and other employment related insurance coverages an into a seamless package that is designed to remove the burden of administrative and regulatory requirements faced by small to mid- Applied is based in Omaha, Nebraska.

The Berkshire Hathaway GUARD Insurance Companies ("Guard") provide workers' compensation business owner's policy umbrella coverage to over 250,000 small and mid-sized businesses. Guard also provides complementary commercial auto and profess expanding number of states. Policies are offered through independent agents and brokers. Guard is based in Wilkes-Barre, Pennsylva Indemnity Company of Omaha, based in Omaha, Nebraska, primarily writes Medicare Supplement insurance and credit in

On October 1, 2018, NICO acquired MLMIC Insurance Company ("MLMIC"). MLMIC has been the leading writer of med liability insurance in New York State for over 40 years. MLMIC distributes its policies on a direct basis to medical and dental profes providers and hospitals.

Investments of insurance businesses—Berkshire's insurance subsidiaries hold significant levels of invested assets. Investm managed by Berkshire's Chief Executive Officer and other in-house investment managers. Investments include a very large portfolio equity securities, which are concentrated in relatively few issuers, as well as fixed maturity securities and cash and short-term inves there are no targeted allocations by investment type or attempts to match investment asset and insurance liability durations. Howe portfolios have historically included a much greater proportion of equity securities than is customary in the insurance in

Invested assets derive from shareholder capital as well as funds provided from policyholders through insurance and reinsu ("float"). Float is the approximate amount of net policyholder funds generated through underwriting activities that is available for inv components of float are unpaid losses and loss adjustment expenses, life, annuity and health benefit liabilities, unearned premiu policyholder liabilities less premium and reinsurance receivables, deferred policy acquisition costs and deferred charges on reinsuran consolidated basis, float has grown from approximately $73 billion at the end of 2012 to approximately $123 billion at the end of through internal growth. The cost of float can be measured as the net pre-tax underwriting loss as a percentage of average float. Over with the exception of 2017, Berkshire's cost of float was negative, as its insurance businesses produced net underwriting gains. The c in 2017 was approximately 3%, primarily attributable to sizable catastrophe losses and foreign currency exchange rate losses relating denominated reinsurance liabilities.

Railroad Business—Burlington Northern Santa Fe

Burlington Northern Santa Fe, LLC ("BNSF") is based in Fort Worth, Texas, and through BNSF Railway Company operates railroad systems in North America. BNSF had approximately 45,000 employees at the end of 2018.

In serving the Midwest, Pacific Northwest, Western, Southwestern and Southeastern regions and ports of the United States, range of products and commodities derived from manufacturing, agricultural and natural resource industries. Freight revenues of BN contractual agreements of varying durations or common carrier published prices or quotations offered by BNSF. BNSF's financial influenced by, among other things, general and industry economic conditions at the international, national and regional

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BNSF's primary routes, including trackage rights, allow it to access major cities and ports in the western and southern Unite parts of Canada and Mexico. In addition to major cities and ports, BNSF efficiently serves many smaller markets by working closely 200 shortline railroads. BNSF has also entered into marketing agreements with other rail carriers, expanding the marketing reach fo their customers. For the year ending December 31, 2018, approximately 35% of freight revenues were derived from consumer pro industrial products, 21% from agricultural products and 18% from coal.

Regulatory Matters

BNSF is subject to federal, state and local laws and regulations generally applicable to all of its businesses. Rail operations regulatory jurisdiction of the Surface Transportation Board ("STB") of the United States Department of Transportation ("DOT"), th Administration of the DOT, the Occupational Safety and Health Administration ("OSHA"), as well as other federal and state regula Canadian regulatory agencies for operations in Canada. The STB has jurisdiction over disputes and complaints involving certain r services, the sale or abandonment of rail lines, applications for line extensions and construction, and the merger with or acquisition common carriers. The outcome of STB proceedings can affect the profitability of BNSF's business.

The DOT and OSHA have jurisdiction under several federal statutes over a number of safety and health aspects of rail operat transportation of hazardous materials. BNSF Railway is required to transport these materials to the extent of its common carrier o agencies regulate some aspects of rail operations with respect to health and safety in areas not otherwise preempted by fed

Environmental Matters

BNSF's rail operations, as well as those of its competitors, are also subject to extensive federal, state and local environme covering discharges to water, air emissions, toxic substances and the generation, handling, storage, transportation and disposal of wa materials. Such regulations effectively increase the costs and liabilities associated with rail operations. Environmental risks are als operations, which frequently involve transporting chemicals and other hazardous materials.

Many of BNSF's land holdings are or were used for industrial or transportation-related purposes or leased to commercial or in whose activities may have resulted in discharges onto the property. As a result, BNSF is subject to, and will from time to time contin environmental cleanup and enforcement actions. In particular, the federal Comprehensive Environmental Response, Compensation ("CERCLA"), also known as the Superfund law, generally imposes joint and several liabilities for the cleanup and enforcement cos former owners and operators of a site, without regard to fault or the legality of the original conduct. Accordingly, BNSF may be re CERCLA and other federal and state statutes for all or part of the costs to clean up sites at which certain substances may have been r its current lessees, former owners or lessees of properties, or other third parties. BNSF may also be subject to claims by third parties cleanup, restoration or other environmental costs under environmental statutes or common law with respect to properties they own impacted by BNSF operations.

Competition

The business environment in which BNSF operates is highly competitive. Depending on the specific market, deregulated m other railroads, as well as river barges, ships and pipelines, may exert pressure on price and service levels. The presence of advanced lines with expedited delivery, subsidized infrastructure and minimal empty mileage continues to affect the market for non-bulk, time The potential expansion of longer combination vehicles could further encroach upon markets traditionally served by railroads. In competitive, BNSF and other railroads seek to develop and implement operating efficiencies to improve productivit

As railroads streamline, rationalize and otherwise enhance their franchises, competition among rail carriers intensifies. BN competitor in the Western region of the United States is the Union Pacific Railroad Company. Other Class I railroads and numerous and motor carriers also operate in parts of the same territories served by BNSF.

Other

BNSF Logistics, LLC, a wholly-owned subsidiary of BNSF, provides non-asset based logistics services to third parties. B services include transportation strategy and execution, managed transportation services, supply chain consulting, project managem reverse logistics, warehousing and cross-docking, and customs house brokerage services.

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Utilities and Energy Businesses—Berkshire Hathaway Energy

Berkshire currently owns 90.9% of the outstanding common stock of Berkshire Hathaway Energy Company ("BHE"). BHE company with subsidiaries that generate, transmit, store, distribute and supply energy. BHE's locally managed businesses are orga operating units. BHE's domestic regulated energy interests are comprised of four regulated utility companies serving approximately customers, two interstate natural gas pipeline companies with approximately 16,400 miles of pipeline and a design capacity of appro cubic feet of natural gas per day and ownership interests in electricity transmission businesses. BHE's Great Britain electricity distri serve about 3.9 million electricity end-users and its electricity transmission-only business in Alberta, Canada serves approximately Canada's population. BHE's interests also include a diversified portfolio of independent power projects, the second-largest reside brokerage firm in the United States, and one of the largest residential real estate brokerage franchise networks in the United State approximately 23,000 people in connection with its various operations.

General Matters

PacifiCorp is a regulated electric utility company headquartered in Oregon, serving electric customers in portions of Utah, C Washington, Idaho and California. The combined service territory's diverse regional economy ranges from rural, agricultural and mi manufacturing and government service centers. No single segment of the economy dominates the combined service territory, whic PacifiCorp's exposure to economic fluctuations. In addition to retail sales, PacifiCorp sells electricity on a wholesale basis to other and wholesalers.

MidAmerican Energy Company ("MEC") is a regulated electric and natural gas utility company headquartered in Iowa, se natural gas customers primarily in Iowa and also in portions of Illinois, South Dakota and Nebraska. MEC has a diverse retail custo of urban and rural residential customers and a variety of commercial and industrial customers. In addition to retail sales and natural MEC sells electricity principally to markets operated by regional transmission organizations and natural gas on a wholesa

NV Energy, Inc. ("NV Energy") is an energy holding company headquartered in Nevada, primarily consisting of two re subsidiaries, Nevada Power Company ("Nevada Power") and Sierra Pacific Power Company ("Sierra Pacific") (collectively, the "N Nevada Power serves retail electric customers in southern Nevada and Sierra Pacific serves retail electric and natural gas customers i The Nevada Utilities' combined service territory's economy includes gaming, mining, recreation, warehousing, manufacturing an services. In addition to retail sales and natural gas transportation, the Nevada Utilities sell electricity and natural gas on a who

As vertically integrated utilities, BHE's domestic utilities own approximately 29,000 net megawatts of generation capacity under construction. The domestic utilities business is subject to seasonal variations principally related to the use of electricity for ai natural gas for heating. Typically, regulated electric revenues are higher in the summer months, while regulated natural gas revenue winter months.

The Great Britain distribution companies consist of Northern Powergrid (Northeast) Limited and Northern Powergrid (York own a substantial electricity distribution network that delivers electricity to end-users in northeast England in an area covering appr square miles. The distribution companies primarily charge supply companies regulated tariffs for the use of their distributio

BHE acquired AltaLink L.P. ("AltaLink") on December 1, 2014. AltaLink is a regulated electric transmission-only util headquartered in Calgary, Alberta. AltaLink connects generation plants to major load centers, cities and large industrial plants thro square mile service territory.

The natural gas pipelines consist of Northern Natural Gas Company ("Northern Natural") and Kern River Gas Transmission River"). Northern Natural, based in Nebraska, owns the largest interstate natural gas pipeline system in the United States, as measure reaching from west Texas to Michigan's Upper Peninsula. Northern Natural's pipeline system consists of approximately 14,700 mi pipelines. Northern Natural's extensive pipeline system, which is interconnected with many interstate and intrastate pipelines in the n has access to supplies from multiple major supply basins and provides transportation services to utilities and numerous other cust Natural also operates three underground natural gas storage facilities and two liquefied natural gas storage peaking units. Northern system experiences significant seasonal swings in demand and revenue, with the highest demand typically occurring during the mo through March.

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Kern River, based in Utah, owns an interstate natural gas pipeline system that consists of approximately 1,700 miles and ex areas in the Rocky Mountains to consuming markets in Utah, Nevada and California. Kern River transports natural gas for electri distribution utilities, major oil and natural gas companies or affiliates of such companies, electric generating companies, energy mar companies, and financial institutions.

BHE Renewables is based in Iowa and owns interests in independent power projects having approximately 4,700 net megav capacity that are in service in California, Texas, Illinois, Nebraska, New York, Arizona, Minnesota, Kansas, Hawaii and the Phil independent power projects sell power generated primarily from wind, solar, geothermal and hydro sources under long-term contra BHE Renewables has invested approximately $2 billion in eleven wind projects sponsored by third parties, commonly referred t investments.

Regulatory Matters

PacifiCorp, MEC and the Nevada Utilities are subject to comprehensive regulation by various federal, state and local agen Energy Regulatory Commission ("FERC") is an independent agency with broad authority to implement provisions of the Federal Po Gas Act, the Energy Policy Act of 2005 and other federal statutes. The FERC regulates rates for wholesale sales of electricity; transm including pricing and regional planning for the expansion of transmission systems; electric system reliability; utility holding compan records retention; securities issuances; construction and operation of hydroelectric facilities; and other matters. The FERC also has authority to assess civil penalties of up to $1.2 million per day per violation of rules, regulations and orders issued under the Federal also subject to regulation by the Nuclear Regulatory Commission pursuant to the Atomic Energy Act of 1954, as amended, with r ownership of the Quad Cities Nuclear Station.

With certain limited exceptions, BHE's domestic utilities have an exclusive right to serve retail customers within their servic turn, have an obligation to provide service to those customers. In some jurisdictions, certain classes of customers may choose to purc of their energy from alternative energy suppliers, and in some jurisdictions retail customers can generate all or a portion of thei Historically, state regulatory commissions have established retail electric and natural gas rates on a cost-of-service basis, designed t opportunity to recover what each state regulatory commission deems to be the utility's reasonable costs of providing services, i opportunity to earn a reasonable return on its investments based on its cost of debt and equity. The retail electric rates of PacifiCo Nevada Utilities are generally based on the cost of providing traditional bundled services, including generation, transmission and di however, rates are available for transmission and distribution-only services.

Northern Powergrid (Northeast) and Northern Powergrid (Yorkshire) each charge fees for the use of their distribution system by a formula prescribed by the British electricity regulatory body, the Gas and Electricity Markets Authority. The current eight-year runs from April 1, 2015 through March 31, 2023.

AltaLink is regulated by the Alberta Utilities Commission ("AUC"), pursuant to the Electric Utilities Act (Alberta), the Pu (Alberta), the Alberta Utilities Commission Act (Alberta) and the Hydro and Electric Energy Act (Alberta). The AUC is an indepen agency with broad authority that may impact many of AltaLink's activities, including its tariffs, rates, construction, operations and fi Electric Utilities Act, AltaLink prepares and files applications with the AUC for approval of tariffs to be paid by the Alberta Electri ("AESO") for the use of its transmission facilities, and the terms and conditions governing the use of those facilities. The AESO is system operator in Alberta, Canada that oversees Alberta's integrated electrical system ("AIES") and wholesale electricity marke responsible for directing the safe, reliable and economic operation of the AIES, including long-term transmission system p

The natural gas pipelines are subject to regulation by various federal, state and local agencies. The natural gas pipeline and st Northern Natural and Kern River are regulated by the FERC pursuant to the Natural Gas Act and the Natural Gas Policy Act of 1 authority, the FERC regulates, among other items, (a) rates, charges, terms and conditions of service and (b) the construction and ope pipelines, storage and related facilities, including the extension, expansion or abandonment of such facilities. Interstate natural gas p are also subject to regulations administered by the Office of Pipeline Safety within the Pipeline and Hazardous Materials Safety A agency within the DOT. Federal pipeline safety regulations are issued pursuant to the Natural Gas Pipeline Safety Act of 1968, as establishes safety requirements in the design, construction, operation and maintenance of interstate natural gas pipeline f

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Environmental Matters

BHE and its energy businesses are subject to federal, state, local and foreign laws and regulations regarding air and water q portfolio standards, emissions performance standards, climate change, coal combustion byproduct disposal, hazardous and solid protected species and other environmental matters that have the potential to impact current and future operations. In addition to im compliance obligations, these laws and regulations, such as the Federal Clean Air Act, provide regulators with the authority to levy s for noncompliance, including fines, injunctive relief and other sanctions.

The Federal Clean Air Act, as well as state laws and regulations impacting air emissions, provides a framework for protecting nation's air quality and controlling sources of air emissions. These laws and regulations continue to be promulgated and implement the operation of BHE's generating facilities and require them to reduce emissions at those facilities to comply with the requ

Renewable portfolio standards have been established by certain state governments and generally require electricity provi minimum percentage of their power from renewable energy resources by a certain date. Utah, Oregon, Washington, California, Iow adopted renewable portfolio standards. In addition, the potential adoption of state or federal clean energy standards, which inclu non-carbon and renewable electricity generating resources, may also impact electricity generators and natural gas prov

In December 2015, an international agreement was negotiated by 195 nations to create a universal framework for coordinate change in what is referred to as the Paris Agreement. The Paris Agreement reaffirms the goal of limiting global temperature increa degrees Celsius, while urging efforts to limit the increase to 1.5 degrees Celsius; establishes commitments by all parties to make nat contributions and pursue domestic measures aimed at achieving the commitments; commits all countries to submit emissions inve regularly on their emissions and progress made in implementing and achieving their nationally determined commitments; and comm submit new commitments every five years, with the expectation that the commitments will get more aggressive. In the context of th the United States agreed to reduce greenhouse gas emissions 26% to 28% by 2025 from 2005 levels. The Paris Agreement formally November 4, 2016.

Supporting the United States' commitment under the Paris Agreement was the Clean Power Plan, which was finalized by the Protection Agency ("EPA") in August 2015. The Clean Power Plan established the Best System of Emission Reduction for fossil-fue include: (a) heat rate improvements; (b) increased utilization of existing combined-cycle natural gas-fueled generating facilities; deployment of new and incremental non-carbon generation placed in service after 2012. The final Clean Power Plan compliance scheduled to begin in 2022, and extend through 2030. When fully implemented, the rule was intended to achieve an overall reductio emissions from existing fossil-fueled electric generating units of 32% below 2005 levels.

On June 1, 2017, President Trump announced that the United States would begin the process of withdrawing from the Paris the terms of the Paris Agreement, withdrawal cannot occur until four years after entry into force, making the United States' withdr November 2020. The EPA issued a proposal to repeal the Clean Power Plan on October 10, 2017, which has not yet been finalized. the EPA proposed the Affordable Clean Energy rule, which would replace the Clean Power Plan. The Affordable Clean Energy rule that the best system of emissions reduction for existing coal fueled power plants is heat rate improvements and proposes a set of can and measures that could improve heat rates. Measures taken to meet the standards of performance must be achieved at the source received comments on the proposal through October 2018 and anticipates finishing the rule in spring 2019. The full impacts of the to repeal and replace the Clean Power Plan are not expected to have a material impact on BHE and its energy subsidiaries. Increa adopting legislation and regulations to reduce greenhouse gas emissions, and local governments and consumers are seeking increasi and renewable energy.

BHE and its energy subsidiaries continue to focus on delivering reliable, affordable, safe and clean energy to its customers mitigate greenhouse gas emissions. For example, through December 31, 2018, BHE's cumulative investment in wind, solar, geoth generation is approximately $25 billion.

Non-Energy Businesses

HomeServices of America, Inc. ("HomeServices") is the second-largest residential real estate brokerage firm in the United S providing traditional residential real estate brokerage services, HomeServices offers other integrated real estate services, including m and mortgage banking, title and closing services, property and casualty insurance, home warranties, relocation services and other ho It operates under 47 brand names with over 42,500 real estate agents in nearly 880 brokerage offices in 30 states and the Distric

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In October 2012, HomeServices acquired a 66.7% interest in one of the largest residential real estate brokerage franchise netw States, which offers and sells independently owned and operated residential real estate brokerage franchises. In April 2018, HomeSe remaining 33.3% interest. HomeServices' franchise network currently includes approximately 370 franchisees in nearly 1,600 br throughout the United States and Europe with over 51,500 real estate agents under two brand names. In exchange for certain fees provides the right to use the Berkshire Hathaway HomeServices or Real Living brand names and other related service marks, as w orientation programs, training and consultation services, advertising programs and other services.

HomeServices' principal sources of revenue are dependent on residential real estate sales, which are generally higher in the quarters of each year. This business is highly competitive and subject to the general real estate market conditions.

Manufacturing Businesses

Berkshire's numerous and diverse manufacturing subsidiaries are grouped into three categories: (1) industrial products, (2) bu (3) consumer products. Berkshire's industrial products businesses manufacture specialty chemicals, metal cutting tools, components power generation applications, and a variety of other products primarily for industrial use. The building products group produces pre built residential homes, flooring products, insulation, roofing and engineered products, building and engineered components, paint bricks and masonry products, which are primarily used in building and construction applications. The consumer products group recreational vehicles, alkaline batteries, various apparel products, jewelry and custom picture framing products. Information conc activities of these three groups follows.

Industrial products

Precision Castparts

Berkshire acquired Precision Castparts Corp. ("PCC") on January 29, 2016. PCC manufactures complex metal componen provides high-quality investment castings, forgings, fasteners/fastener systems and aerostructures for critical aerospace and pow applications. PCC also manufactures seamless pipe for coal-fired, industrial gas turbine ("IGT") and nuclear power plants; downhole fittings and various mill forms in a variety of nickel and steel alloys for severe-service oil and gas environments; investment casting general industrial, armament, medical and other applications; nickel and titanium alloys in all standard mill forms from large ingots foil, sheet, strip, tubing, bar, rod, extruded shapes, rod-in-coil, wire and welding consumables, as well as cobalt alloys, for the aer processing, oil and gas, pollution control and other industries; revert management solutions; fasteners for automotive and general i specialty alloys for the investment casting and forging industries; heat treating and destructive testing services for the investment c forging industries; refiner plates and other products for the pulp and paper industry; grinder pumps and affiliated components for lo systems; critical auxiliary equipment and gas monitoring systems for the power generation industry; and metalworking tools for the f other applications.

Investment casting technology involves a multi-step process that uses ceramic molds in the manufacture of metal compon complex shapes, closer tolerances and finer surface finishes than parts manufactured using other methods. PCC uses this process products for aircraft engines, IGT's and other aeroderivative engines, airframes, medical implants, armament, unmanned aerial ve industrial applications. PCC also manufactures high temperature carbon and ceramic composite components, including ceramic mat use in next-generation aerospace engines.

PCC uses forging processes to manufacture components for the aerospace and power generation markets, including seamless industrial gas turbine and nuclear power plants, and downhole casings and tubing pipe for severe service oil and gas markets. PCC r performance, nickel-based alloys used to produce forged components for aerospace and non-aerospace applications in such marke chemical processing and pollution control. The titanium products are used to manufacture components for the commercial and milita generation, energy, and industrial end markets.

PCC is also a leading developer and manufacturer of highly engineered fasteners, fastener systems, aerostructures and preci primarily for critical aerospace applications. These products are produced for the aerospace and power and energy markets, as well a automotive, heavy truck, farm machinery, mining and construction equipment, shipbuilding, machine tools, medical equipment, recreation markets.

The majority of PCC's sales are from purchase orders or demand schedules pursuant to long-term agreements. Contractual t for termination by the customer, subject to payment for work performed. PCC typically does not experience significant order cance periodically it receives requests for delays in delivery schedules.

PCC is subject to substantial competition in all of its markets. Components and similar products may be produced by competi the same types of manufacturing processes as PCC or other processes. Although PCC believes its manufacturing processes, technolo provide advantages to its customers, such as high quality, competitive prices and physical properties that often meet more stringent d forms of manufacturing can be used to produce many of the same components and products. Despite intense competition, PCC is a most of its principal markets. Several factors, including long-standing customer relationships, technical expertise, state-of-the-art faci employees, aid PCC in maintaining competitive advantages.

A number of raw materials in its products, including certain metals such as nickel, titanium, cobalt, tantalum and molybdenu a few parts of the world. These metals are required for the alloys used in manufactured products. The availability and costs of thes influenced by private or governmental cartels, changes in world politics, labor relations between the metal producers and their wo unstable governments in exporting nations and inflation.

Lubrizol Corporation

The Lubrizol Corporation (“Lubrizol”) is a specialty chemical company that produces and supplies technologies for the glo industrial and consumer markets. Lubrizol currently operates in two business sectors: (1) Lubrizol Additives, which includes engine additives and industrial specialties products; and (2) Lubrizol Advanced Materials, which includes personal and home care, engin performance coatings, skin care and life science solutions.

Lubrizol Additives products are used in a broad range of applications including engine oils, transmission fluids, gear oils, s lubricants, fuel additives, metalworking fluids, compressor lubricants and greases for transportation and industrial applications. Lu Materials products are used in several different types of applications including over-the-counter pharmaceutical products, perfor personal care products, sporting goods and plumbing and fire sprinkler systems. Lubrizol is an industry leader in many of the ma competes. Lubrizol’s principal lubricant additives competitors are Infineum International Ltd., Chevron Oronite Company and A Corporation. The advanced materials industry is highly fragmented with a variety of competitors in each product li

From a base of approximately 3,500 patents, Lubrizol uses its technological leadership position in product development a expertise to improve the quality, value and performance of its products, as well as to help minimize the environmental impact of Lubrizol uses many specialty and commodity chemical raw materials in its manufacturing processes and uses base oil in processi additives. Raw materials are primarily feedstocks derived from petroleum and petrochemicals and, generally, are obtainable from se materials that Lubrizol chooses to purchase from a single source typically are subject to long-term supply contracts to ensure supply operates facilities in 27 countries (including production facilities in 17 countries and laboratories in 13 countries).

Lubrizol markets its products worldwide through a direct sales organization and sales agents and distributors. Lubrizol’s cus consist of major global and regional oil companies and industrial and consumer products companies that are located in more than 12 of its largest customers also may be suppliers. In 2018, no single customer accounted for more than 10% of Lubrizol’s consolidated continues to implement a multi-year phased investment plan to upgrade operations, ensure compliance with health, safety and e requirements and increase global manufacturing capacity.

Lubrizol is subject to foreign, federal, state and local laws to protect the environment and limit manufacturing waste and company believes that its policies, practices and procedures are designed to limit the risk of environmental damage and consequent Nevertheless, the operation of manufacturing plants entails ongoing environmental risks, and significant costs or liabilities could b future.

IMC International Metalworking Companies

IMC International Metalworking Companies (“IMC”) is one of the world’s three largest multinational manufacturers of con carbide metal cutting tools for applications in a broad range of industrial end markets. IMC’s principal brand names include *ISCA* *Ingersoll®*, *Tungaloy®*, *Unitac®*, *UOP®*, *It.te.di®*, *Qutiltec®*, *Tool—Flo®* and *PCT*. IMC’s primary manufacturing facilities are locat States, Germany, Italy, France, Switzerland, South Korea, China, India, Japan and Brazil.

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IMC has five primary product lines: milling tools, gripping tools, turning/thread tools, drilling tools and tooling. The main within each product line between consumable cemented tungsten carbide inserts and steel tool holders. Inserts comprise the vast ma earnings. Metal cutting inserts are used by industrial manufacturers to cut metals and are consumed during their use in cutting ap manufactures hundreds of types of highly engineered inserts within each product line that are tailored to maximize productivity and requirements of customers. IMC's staff of scientists and engineers continuously develop and innovate products that address end requirements.

IMC's global sales and marketing network operates in virtually every major manufacturing center around the world staffed engineers and technical personnel. IMC's customer base is very diverse, with its primary customers being large, multinational bu automotive, aerospace, engineering and machinery industries. IMC operates a regional central warehouse system with locations in Is Belgium, Korea, Japan and Brazil. Additional small quantities of products are maintained at local IMC offices in order to provide support and inventory management.

IMC competes in the metal cutting tools segment of the global metalworking tools market. The segment includes hundreds c range from small, private manufacturers of specialized products for niche applications and markets to larger, global multinational b Sandvik and Kennametal, Inc.) with a wide assortment of products and extensive distribution networks. Other manufacturing co Kyocera, Mitsubishi, Sumitomo, Ceratizit and Korloy also play a significant role in the cutting tool market.

Marmon Holdings

Marmon Holdings, Inc. ("Marmon") is a global industrial organization comprising 13 diverse business sectors and more tha manufacturing and service businesses. Marmon's manufacturing and service operations employ over 20,000 employees at appro manufacturing, distribution, and service facilities located primarily in the United States, as well as 21 other countries worldwide. M sectors are described as follows.

Beverage Technologies manufactures beverage dispensing and cooling equipment, and related products for global brand own retailers. Operations are based in the U.S. with manufacturing in China, India, the U.K. and Germany. Products are sold primarily th Europe, and Asia.

Foodservice Technologies manufactures hot and cold food preparation and holding equipment for restaurants, cafeterias, ho other foodservice providers worldwide. Operations are based in the U.S., with manufacturing in China and Italy. Products are sold p the U.S., Europe, and Asia.

Water Technologies manufactures water treatment equipment for residential, commercial, and industrial applications worldw based primarily in the U.S., Canada, China, Singapore, India, and Mexico with business centers located in Belgium, France, Poland, Italy, Switzerland, and U.A.E.

Transportation Products serves the automotive, heavy-duty highway transportation, and aerospace industries with precisio components; fastener thread solutions; metal tubing; auto aftermarket transmission and chassis products; platform trailers; and t components. Operations and business are conducted primarily in the U.S., Mexico, Canada, Europe, and Asia.

Retail Solutions provides retail environment design services; in-store digital merchandising and display fixtures; shopping, and security carts; and consumer products, including air compressors and extension cords. Operations are based in the U.S. and con the U.S., U.K., Czech Republic, and China.

Metal Services provides specialty metal pipe, tubing, beams and related value-added services to customers across a broad ra Operations are based in the U.S., Canada, and Mexico and conducted primarily in those countries.

Engineered Wire & Cable produces electrical and electronic wire and cable for use in energy, transit, aerospace, defense, co other industrial applications. Operations are based in the U.S., Canada, India, and England. Business is conducted globally, prima Canada, India, U.K., U.A.E., and China.

Electrical Products produces electrical wire and cable for use in utility applications and residential and commercial buildi lighting equipment for mining and safety markets. Operations are based in the U.S. and business is conducted primarily in the U.

Plumbing & Refrigeration supplies copper, aluminum, and stainless steel tubing and fittings for the plumbing, HVAC, and re and aluminum and brass forgings for many commercial and industrial applications. Business and operations are conducted prima

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Industrial Products supplies construction fasteners; gloves and other protective wear; gear drives, gearboxes, fan drives, an various markets; wind machines for agricultural use; and wheels, axles, and gears for rail, mining, and other applications. Operatio U.S. and business is conducted primarily in the U.S., Canada, and China.

Rail Products and Services manufactures, leases, and maintains railcars; manufactures mobile railcar movers; provides in-p and loading services; performs track construction and maintenance; and manufactures steel tank heads and cylinders. Union Tan ("UTLX") is the largest component of Rail Products and Services and is a leading designer, builder, and full-service lessor of railr other specialized railcars. Together with its Canadian affiliate Procor, UTLX owns a fleet of approximately 130,000 railcars for lea chemical, petrochemical, energy, and agricultural/food industries. UTLX manufactures tank cars at two U.S. plants and performs ra services at more than 100 locations across North America.

UTLX has a diversified customer base, both geographically and across industries. UTLX, while subject to cyclicality and sig in most of its markets, competes by offering a broad range of high-quality products and services targeted at its niche markets. Rail leased for multiple-year terms and most of the leases are renewed upon expiration. Due to selective ongoing capital investment, uti number of railcars on lease to total available) of the railcar fleet are generally high. Following the downturn of oil and gas market renewal rental rates have declined for some railcar types and has resulted in a decline in utilization, which has had a meaningful in results. While tank car specifications are highly regulated in North America, regulatory changes are not expected to materially affec results, competitive position, or financial strength.

Intermodal Containers leases intermodal tank containers through EXSIF Worldwide. EXSIF is a leading international lessor containers with a fleet of approximately 60,000 units, primarily serving chemical producers and logistics operator

Crane Services is a provider of mobile cranes and operators. Sterling Crane (located in Canada and the U.S.), Freo Group, (both located in Australia), operate a combined fleet of approximately 1,000 cranes primarily serving the energy, mining, and petro

Other industrial products

CTB International Corp. ("CTB"), headquartered in Milford, Indiana, is a leading global designer, manufacturer and markete agricultural systems and solutions for preserving grain, producing poultry, pigs and eggs, and for processing poultry, fish, vegetable CTB operates from facilities located around the globe and supports customers through a worldwide network of independent distri

CTB competes with a variety of manufacturers and suppliers, many of which offer only a limited number of the products of two of which offer products across many of CTB's product lines. Competition is based on the price, value, reputation, quality and de offered and the customer service provided by distributors, dealers and manufacturers of the products. CTB's leading brand names, d diversified product line, product support and high-quality products enable it to compete effectively. CTB manufactures its produc galvanized steel, steel wire, stainless steel and polymer materials and supplies of these materials have been sufficient in re

In 2014, Berkshire acquired a global supplier of pipeline flow improver products from Phillips 66. The business, headquar Texas, was named Phillips Specialty Products, Inc. at the time of the acquisition and is currently named LiquidPower Specialty Prod LSPI specializes in maximizing the flow potential of pipelines, increasing operational flexibility and throughput capacity. The Scot are a group of businesses that manufacture, distribute, service and finance a wide variety of products for residential, industrial and

Berkshire's industrial products manufacturers employ approximately 81,000 persons.

Building Products

Clayton Homes

Clayton Homes, Inc. ("Clayton"), headquartered near Knoxville, Tennessee, is a vertically integrated housing company utiliz modular and site built methods. Clayton's homes are marketed in 48 states through a network of 2,149 retailers, including 366 comp centers and 280 subdivisions. Home finance and insurance products are offered through its subsidiaries primarily to purchasers of r modular homes.

Clayton acquired its first site builder in 2015 and, thereafter, added seven additional site builders. Clayton delivered 51,569 various price points. Clayton competes based on price, service, delivery capabilities and product performance and considers the financing available to retail purchasers a factor affecting the market acceptance of its products.

Clayton's financing programs support company-owned home centers and select independent retailers. Proprietary loan under have been developed and include ability to repay calculations, including debt to income limits, consideration of residual income requirements, which are considered in evaluating loan applicants. Currently, approximately 61% of the loan originations are home- remaining 39% have land as additional collateral. The average down payment is approximately 15%, which may be from cash, tra Certain loan types require an independent third-party appraisal. Originated loans are at fixed rates and for fixed terms. Loans outs non-government originations, bulk purchases of contracts and notes from banks and other lenders. Clayton also provides inventory f independent retailers and community operators and services housing contracts and notes that were not purchased or originated. Th purchases and servicing arrangements may relate to the portfolios of other lenders or finance companies, governmental agencies, or purchase and hold housing contracts and notes. Clayton also acts as an agent on physical damage insurance policies, homebuyer prot and other programs.

Shaw Industries

Shaw Industries Group, Inc. ("Shaw"), headquartered in Dalton, Georgia, is a leading carpet manufacturer based on both reve production. Shaw designs and manufactures over 3,900 styles of tufted carpet, wood and resilient flooring for residential and comm about 30 brand and trade names and under certain private labels. Shaw also provides project management and installation serv manufacturing operations are fully integrated from the processing of raw materials used to make fiber through the finishing of carp acquired Sanquahar Tile Services in Scotland, which manufactures and distributes carpet tile throughout Europe. Shaw also manufac a variety of hardwood, vinyl and laminate floor products ("hard surfaces"). In 2016, Shaw acquired USFloors, Inc., which is a lead marketer of wood-plastic composite luxury vinyl tile flooring, as well as cork, bamboo and hardwood products. Shaw's carpet and ha are sold in a broad range of patterns, colors and textures. Shaw operates Shaw Sports Turf and Southwest Greens International, LL synthetic sports turf, golf greens and landscape turf products.

Shaw products are sold wholesale to over 39,000 retailers, distributors and commercial users throughout the United States, C and are also exported to various overseas markets. Shaw's wholesale products are marketed domestically by over 2,700 salaried and personnel directly to retailers and distributors and to large national accounts. Shaw's seven carpet, seven hard surface and two sam distribution facilities and 26 redistribution centers, along with centralized management information systems, enable it to provide pr delivery of its products to both its retail customers and wholesale distributors.

Substantially all carpet manufactured by Shaw is tufted carpet made from nylon, polypropylene and polyester. In the tufting inserted by multiple needles into a synthetic backing, forming loops, which may be cut or left uncut, depending on the desired textu During 2018, Shaw processed approximately 95% of its requirements for carpet yarn in its own yarn processing facilities. The av materials continues to be good but costs are impacted by petro-chemical and natural gas price changes. Raw material cost changes factored into selling prices to customers.

The floor covering industry is highly competitive with more than 100 companies engaged in the manufacture and sale of ca States and numerous manufacturers engaged in hard surface floor covering production and sales. According to industry estimates, c approximately 50% of the total United States consumption of all flooring types. The principal competitive measures within the floor are quality, style, price and service.

Johns Manville

Johns Manville (“JM”) is a leading manufacturer and marketer of premium-quality products for building, mechanical and in commercial roofing and roof insulation, as well as engineered fibers and nonwovens for commercial, industrial and residential appli markets that include building, flooring, interiors, aerospace, automotive and transportation, air handling, appliance, HVAC, pipe ins waterproofing and wind energy. Fiberglass is the basic material in a majority of JM’s products, although JM also manufactures a sig its products with other materials to satisfy the broader needs of its customers. Raw materials are readily available in sufficient quant sources for JM to maintain and expand its current production levels. JM regards its patents and licenses as valuable, however it does its businesses to be materially dependent on any single patent or license. JM is headquartered in Denver, Colorado, and operates 4 facilities in North America, Europe and China and conducts research and development at its technical center in Littleton, Colorado ar in the U.S. and Europe.

Fiberglass is made from earthen raw materials and recycled glass, together with proprietary organic and acrylic-based formal to bind many of its glass fibers. JM’s products also contain materials other than fiberglass, including various chemical and petro- materials used in roofing and other specialized products. JM uses recycled material when available and suitable to satisfy the broa customers. The raw materials used in these various products are readily available in sufficient quantities from various sources to mai current production levels.

JM’s operations are subject to a variety of federal, state and local environmental laws and regulations, which regulate the dis into the air, land and water and govern the use and disposal of hazardous substances. The most relevant of the federal laws are the Fe the Clean Water Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act and the Comprehensive Enviro Compensation and Liability Act of 1980, which are administered by the EPA. In 2015, the EPA revised the hazardous air pollutant fiberglass and mineral wool manufacturing industries, which were further revised in 2017. While the new rules implement new emiss are not expected to require material expenditures to meet the compliance dates in 2020.

JM sells its products through a wide variety of channels including contractors, distributors, retailers, manufacturers and fabri in highly competitive markets, with competitors comprised primarily of several large global and national manufacturers and sm manufacturers. JM holds leadership positions in the key markets that it serves. JM’s products compete primarily on value, diffe customization, and breadth of product line. Sales of JM’s products are moderately seasonal due to increases in construction activity in the second and third quarters of the calendar year. JM sees a marketplace trend in customer purchasing decisions being influenced and energy efficient attributes of its products, services and operations.

MiTek Industries, Inc.

MiTek Industries, Inc. (“MiTek”), based in Chesterfield, Missouri, operates in three separate markets: residential, commerc MiTek operates worldwide with sales in over 100 countries and with manufacturing facilities and/or sales/engineering offices locate MiTek has completed a number of bolt-on acquisitions in the past five years, intended to diversify product offerings and reduce t cyclical global housing markets.

In the residential market, MiTek is a leading supplier of engineered connector products, construction hardware, engineeri services and computer-driven manufacturing machinery to the truss component market of the building components industry. MiTek’s are component manufacturers who manufacture prefabricated roof and floor trusses and wall panels for the residential building mark construction hardware to commercial distributors and do-it-yourself retail stores under the MiTek Builders Products n

MiTek’s commercial market business includes products and services sold to the commercial construction industry offer subsidiaries. Commercial products include curtain wall systems (Benson Industries, Inc.), masonry and stone anchoring systems (Ho Inc.), light gauge steel framing products (Aegis Metal Framing Division of MiTek USA, Inc.), engineering services for a proprietary steel frame connection (SidePlate Systems, Inc.) and a comprehensive range of ductwork for the ventilation market (M&M Manuf Snappy ADP, Inc.).

MiTek’s industrial market business includes products offered through its subsidiaries, including automated machinery u manufacturers (TBS Engineering, Ltd.), customized air handling systems for commercial, institutional and industrial markets (TMI Inc.), design and supply of Nuclear Safety Related HVAC systems and components (Ellis & Watts Global Industries, Inc.), energ dehumidification systems for commercial applications (Heat-Pipe Technology, Inc.) and pre-engineered and pre-fabricated custom st and platforms for distribution and manufacturing facilities (Cubic Designs, Inc. and Mezzanine International, Ltd.)

A significant raw material used by MiTek is hot dipped galvanized sheet steel. While supplies are presently adequate, variati historically occurred, producing significant variations in cost and availability.

MiTek commenced reorganizing efforts in 2019 to focus on a “One MiTek” brand, operating as one global company operati residential and commercial. Within the sectors, the business will be further managed based on market channels or product categories. is expected to provide customers with more targeted solutions and produce a more simplified, efficient and better-integrated organi

Benjamin Moore

Benjamin Moore & Co. (“Benjamin Moore”), headquartered in Montvale, New Jersey, is a leading formulator, manufacture broad range of architectural coatings, available principally in the United States and Canada. Products include water-based and solve purpose coatings (paints, stains and clear finishes) for use by consumers, contractors and industrial and commercial users. Products a various registered brand names, including, but not limited to: *Aura®, Natura®, Regal Select®, Ultra Spec®, ben®, Eco Spec®, Coro Insl-x®, Lenmar®, Super Kote®, Arborcoat®, Super Hide®, Century®, Ultra Spec®, SCUFF-X® and Notable®™*

Benjamin Moore relies primarily on an independent dealer network for distribution of its products. Benjamin Moore’s dist includes over 3,300 independent retailers currently representing over 5,000 storefronts in the United States and Canada. The indepen offers a broad array of products including *Benjamin Moore®, Coronado®* and *Insl-x®* brands and other competitor coatings, wall c treatments and sundries. In addition, Benjamin Moore operates an on-line “pick up in store” program, which allows consumers to p e-commerce site, or for national accounts and government agencies via its customer information center, for pick-up at the custome

Benjamin Moore competes with numerous manufacturers, distributors and paint, coatings and related products retailers. Prod innovation, breadth of product line, technical expertise, service and price determine the competitive advantage. Competitors includ decorating stores, mass merchandisers, home centers, independent hardware stores, hardware chains and manufacturer-operated dire Sherwin-Williams Company, PPG Industries, Inc., The Valspar Corporation, The Home Depot, Inc. and Lowe’s Compan

The most significant raw materials in Benjamin Moore products are titanium dioxide, monomers, polymers and pigments. I materials have been generally available, with pricing and availability subject to fluctuation.

Acme Brick

Acme Brick Company and its subsidiaries (“Acme”), headquartered in Fort Worth, Texas, manufactures and distributes cl *Brick®*) and concrete block (*Featherlite*). In addition, Acme distributes a number of other building products of other manufacturers, wall tile, wood flooring and other masonry products. Products are sold primarily in the South Central and South Eastern United company-operated sales offices. Acme distributes products primarily to homebuilders and masonry and general contra

In 2018, Acme commenced the closings of two brick plants, three concrete block plants and two limestone fabricating plants will operate 15 clay brick manufacturing facilities at 12 sites located in seven states and three concrete block facilities in Texas. In operates an aluminum grid fabrication facility and a concrete bagging facility in Texas. The demand for Acme’s products is seasonal, the warmer weather months, and is subject to the level of construction activity, which is cyclical. Acme also owns and leases prope rights that supply raw materials used in many of its manufactured products. Acme’s raw materials supply is believed to be

The brick industry is subject to the EPA’s Maximum Achievable Control Technology Rule (MACT Rule) finalized in Octob deadline for compliance of December 31, 2018. Key elements of the MACT Rule include emission limits established for certain haza and acidic gases. The MACT Rule also establishes work practices for “periodic” kilns, including using a designed firing time and te product, labeling maximum loads, keeping a log of each load, and developing and implementing inspection and maintenance procedu Acme’s facilities are in compliance, additional capital expenditures may be required to bring other facilities into compliance. Acme a granted an extension of the compliance deadline until the pending state permits are received, or until December 26, 2019, which

Berkshire’s building products manufacturers employ approximately 57,000 people.

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Consumer Products

Apparel

Fruit of the Loom ("FOL"), headquartered in Bowling Green, Kentucky, is primarily a manufacturer and distributor of basic a casualwear, athletic apparel and sports equipment. Products under the *Fruit of the Loom®* and *JERZEES®* labels are primarily so merchandise, mid-tier chains and wholesale markets. In the Vanity Fair Brands product line, *Vassarette®*, *Curvation®* and *Radiant®* sold in the mass merchandise market, while *Vanity Fair®* and *Lily of France®* products are sold to mid-tier chains and department markets and sells apparel, sports equipment and balls to team dealers and athletic apparel, sports equipment and balls to sporting go the *Russell Athletic®* and *Spalding®* brands. Additionally, *Spalding®* markets and sells balls and sports equipment in the mass merch dollar store channels. In 2018, approximately 55% of FOL's sales were to five customers.

FOL generally performs its own knitting, cloth finishing, cutting, sewing and packaging for apparel. For the North American FOL's predominant sales region, the majority of FOL's cloth manufacturing is performed in Honduras. Labor-intensive cutting, sew operations are located in Central America, the Caribbean and Vietnam. For the European market, products are either sourced fro contractors in Europe or Asia or sewn in Morocco from textiles internally produced in Morocco. Manufacturing of bras, athletic eq goods and other athletic apparel lines are generally sourced from third-party contractors located primarily in Asia.

U.S. grown cotton and polyester fibers are the main raw materials used in the manufacturing of FOL's apparel products and a limited number of third-party suppliers. Additionally in 2015, FOL entered into an eight year agreement with one key supplier to pro FOL's yarn. Management currently believes there are readily available alternative sources of raw materials and yarn. However, if r suppliers cannot be maintained or delays occur in obtaining alternative sources of supply, production could be adversely affected, w corresponding adverse effect on results of operations. Additionally, raw materials are subject to price volatility caused by weather, s government regulations, economic climate and other unpredictable factors. FOL has secured contracts to purchase cotton, either dire yarn suppliers, to meet the majority of its production plans for 2019. FOL's markets are highly competitive, consisting of many do manufacturers and distributors. Competition is generally based upon product features, quality, customer service and p

Garan designs, manufactures, imports and sells apparel primarily for children, including boys, girls, toddlers and infants. Prod its own trademark *Garanimals®* and customer private label brands. Garan also licenses its registered trademark *Garanimals®* to thir and non-apparel products. Garan conducts its business through operating subsidiaries located in the United States, Central America products are sold through its distribution centers in the United States. Fechheimer Brothers manufactures, distributes and sells unifo the public service and safety markets, including police, fire, postal and military markets. Fechheimer Brothers is based in Cinc

The BH Shoe Holdings Group manufactures and distributes work, rugged outdoor and casual shoes and western-style footw of brand names, including *Justin, Original Work, Tony Lama®, Chippewa®, BØRN® , B•Ø•C®, Carolina®, EuroSofft, Söfft, Dou Nursemates®* and *Comfortiva®*. Brooks Sports markets and sells performance running footwear and apparel to specialty and natio directly to consumers under the *Brooks®* brand. A significant volume of the shoes sold by Berkshire's shoe businesses are manufact from sources located outside the United States. Products are sold worldwide through a variety of channels including department store specialty stores, catalogs and the Internet, as well as through company-owned retail stores.

Other consumer products

Forest River, Inc. ("Forest River") is a manufacturer of recreational vehicles ("RV"), utility cargo trailers, buses and po headquartered in Elkhart, Indiana with products sold in the United States and Canada through an independent dealer network. Fo numerous manufacturing facilities located in six states. Forest River is a leading manufacturer of RVs with numerous brand names, River, Coachman RV and Prime Time. Utility cargo trailers are sold under a variety of brand names. Buses are sold under severa including Starcraft Bus. Pontoon boats are sold under the Berkshire, South Bay and Trifecta brand names. The RV industry is ve Competition is based primarily on price, design, quality and service. The industry has consolidated over the past several years with F a market share of approximately 33% in 2018 and its largest competitor holding a market share of approximately 48

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Berkshire acquired the Duracell Company ("Duracell'), on February 29, 2016 from The Procter & Gamble Company. Durace Chicago, Illinois, is a leading manufacturer of high performance alkaline batteries. Duracell manufactures batteries in the U.S., Euro provides a network of worldwide sales and distribution centers. Costco and Walmart are significant customers, representing appro Duracell's annual revenue. There are several competitors in the battery manufacturing market with Duracell holding an approximatel of the global alkaline battery market. Management believes there are sufficient sources of raw materials, which primarily include manganese.

Albecca Inc. ("Albecca"), headquartered in Norcross, Georgia, operates in the U.S., Canada and 13 other countries, with p under the *Larson-Juhl®* name. Albecca designs, manufactures and distributes a complete line of high quality, branded custom fra including wood and metal moulding, matboard, foamboard, glass and framing supplies. Complementary to its framing products, A printing and fulfillment services.

Richline Group, Inc. operates four strategic business units: Richline Jewelry, LeachGarner, Rio Grande and Inverness. Each manufacturer and distributor of jewelry with precious metal and non-precious metal products to specific target markets including la department stores, shopping networks, mass merchandisers, e-commerce retailers and artisans plus worldwide manufacturers and w medical, electronic and aerospace industries.

Berkshire's consumer products manufacturers employ approximately 55,000 persons.

Service and Retailing Businesses

Service Businesses

Berkshire's service businesses provide grocery and foodservice distribution, professional aviation training programs, fra ownership programs and distribution of electronic components. Other service businesses include franchising and servicing of quick s media businesses (newspaper, television and information distribution), as well as logistics businesses. Berkshire's service busin approximately 51,000 people. Information concerning these activities follows.

McLane Company

McLane Company, Inc. ("McLane") provides wholesale distribution services in all 50 states to customers that include con discount retailers, wholesale clubs, drug stores, military bases, quick service restaurants and casual dining restaurants. McLane pro distribution services to Walmart, which accounts for approximately 22% of McLane's revenues. McLane's other significant custome and Yum! Brands, each of which accounted for approximately 11% of McLane's revenues in 2018. A curtailment of purchasing by W significant customers could have a material adverse impact on McLane's periodic revenues and earnings. McLane's business model volume of sales, rapid inventory turnover and stringent expense controls. Operations are currently divided into three business units: g foodservice distribution and beverage distribution.

McLane's grocery distribution unit, based in Temple, Texas, maintains a dominant market share within the convenience store most of the national convenience store chains and major oil company retail outlets. Grocery operations provide products to approxin locations nationwide, including Walmart. McLane's grocery distribution unit operates 23 distribution facilities in 20 st

McLane's foodservice distribution unit, based in Carrollton, Texas, focuses on serving the quick service and casual dining r with high quality, timely-delivered products. Operations are conducted through 47 facilities in 22 states. The foodservice distribut approximately 35,200 restaurants nationwide.

Through its subsidiaries, McLane also operates several wholesale distributors of distilled spirits, wine and beer. Operation through 14 distribution centers in Georgia, North Carolina, Tennessee and Colorado. These beverage units operating as Empire Dis Distributors of North Carolina, Empire Distributors of Tennessee and Baroness Small Estates, service approximately 25,300 retail Southeastern United States and Colorado.

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FlightSafety International

FlightSafety International Inc. ("FlightSafety"), headquartered at New York's LaGuardia Airport, is an industry leader in pro training services to individuals, businesses (including certain commercial aviation companies) and the U.S. government and ce governments. FlightSafety provides high technology training to pilots, aircraft maintenance technicians, flight attendants and dispat and support a wide variety of business, commercial and military aircraft. FlightSafety operates a large fleet of advanced full flight learning centers and training locations in the United States, Canada, China, France, Japan, Norway, Singapore, South Africa, the Ne United Kingdom. The vast majority of FlightSafety's instructors, training programs and flight simulators are qualified by the Unit Aviation Administration and other aviation regulatory agencies around the world.

FlightSafety is also a leader in the design and manufacture of full flight simulators, visual systems, displays and other adva training devices. This equipment is used to support FlightSafety training programs and is offered for sale to airlines and governm organizations around the world. Manufacturing facilities are located in Oklahoma, Missouri and Texas. FlightSafety strives to mainta simulators and develop courseware using state-of-the-art technology and invests in research and development as it builds new equip programs.

NetJets

NetJets Inc. ("NetJets") is the world's leading provider of shared ownership programs for general aviation aircraft. NetJets' g is located in Columbus, Ohio, with most of its logistical and flight operations based at Port Columbus International Airport. Net operations are based in Lisbon, Portugal. The shared ownership concept is designed to meet the travel needs of customers who re flexibility and access of a large fleet that whole aircraft ownership cannot deliver. In addition, shared ownership programs are avail flight departments seeking to outsource their general aviation needs or add capacity for peak periods and for others that previously

With a focus on safety and service, NetJets' programs are designed to offer customers guaranteed availability of aircraft, pre costs and increased liquidity. NetJets' shared aircraft ownership programs permit customers to acquire a specific percentage of a certa allows customers to utilize the aircraft for a specified number of flight hours annually. In addition, NetJets offers prepaid flight cards solutions and services for aircraft management, customized aircraft sales and acquisition, ground support and flight operation servic of programs including NetJets Shares™, NetJets Leases™ and the Marquis Jet Card®.

NetJets is subject to the rules and regulations of the United States Federal Aviation Administration, the National Institute of Portugal and the European Aviation Safety Agency. Regulations address aircraft registration, maintenance requirements, pilot qualifi operations, including flight planning and scheduling as well as security issues and other matters.

TTI, Inc.

TTI, Inc. ("TTI"), headquartered in Fort Worth, Texas, is a global specialty distributor of passive, interconnect, electromecha components used by customers in the manufacturing and assembling of electronic products. TTI's customer base includes origi manufacturers, electronic manufacturing services, original design manufacturers, military and commercial customers, as well as de engineers. TTI's distribution agreements with the industry's leading suppliers allow it to uniquely leverage its product cost and to exp providing new lines and products to its customers. TTI operates sales offices and distribution centers from more than 100 locations America, Europe, Asia and Israel.

TTI services a variety of industries including telecommunications, medical devices, computers and office equipment, mili automotive and industrial electronics. TTI's core customers include businesses in the design through production stages in the elect supply chain, which supports its high volume business, and its Mouser subsidiary, which supports a broader base of customers wi purchases through internet based marketing.

Other

XTRA Corporation (“XTRA”), headquartered in St. Louis, Missouri, is a leading transportation equipment lessor operating Lease® brand name. XTRA manages a diverse fleet of approximately 82,000 units located at 51 facilities throughout the United S includes over-the-road and storage trailers, chassis, temperature controlled vans and flatbed trailers. XTRA is one of the largest lessor available) of over-the-road trailers in North America. Transportation equipment customers lease equipment to cover cyclical, season needs and as a substitute for purchasing equipment. Therefore, as a provider of marginal capacity to its customers, XTRA’s utiliz operating results tend to be cyclical. In addition, transportation providers often use leasing to maximize their asset utilization and expenditures. By maintaining a large fleet, XTRA is able to provide customers with a broad selection of equipment and quick re

International Dairy Queen develops and services a worldwide system of over 6,900 stores operating primarily under the nan *Chill®, Dairy Queen®* and *Orange Julius®* that offer various dairy desserts, beverages, prepared foods and blended fruit drinks. Busi electronic dissemination of full-text news releases to the media, online services and databases and the global investment community and in 45 languages. Approximately 97% of Business Wire’s revenues derive from its core news distribution business. CORT Bu Corporation is a leading national provider of rental relocation services including rental furniture, accessories and related services in market of the furniture rental industry. The Buffalo News and BH Media Group, Inc. are publishers of 31 daily and 43 weekly newsp is an ABC affiliate broadcast station in Miami, Florida and Charter Brokerage is a leading non-asset based third party logistics provid and chemical industries.

Retailing Businesses

Berkshire’s retailing businesses include automotive, home furnishings and several other operations that sell various consu consumers. Information regarding each of these operations follows. Berkshire’s retailing businesses employ approximately 29

Berkshire Hathaway Automotive

Berkshire acquired a group of affiliated companies referred to as the Berkshire Hathaway Automotive Group, Inc. (BHA) in 2 the largest automotive retailers in the United States, currently operating 108 new vehicle franchises through 82 dealerships located p metropolitan markets in the United States. The dealerships sell new and used vehicles, vehicle maintenance and repair services, e contracts, vehicle protection products and other aftermarket products. BHA also arranges financing for its customers through third-p operates 29 collision service centers directly connected to the dealerships’ operations and owns and operates two auto auctions and a products distribution company.

Dealership operations are highly concentrated in the Arizona and Texas markets, with approximately 70% of dealership-relate from sales in these markets. BHA currently maintains franchise agreements with 27 different vehicle manufacturers, although it der portion of its revenue from the Toyota/Lexus, General Motors, Ford/Lincoln, Nissan/Infiniti and Honda/Acura brands. Approximate annual revenues are from dealerships representing these manufacturers.

The retail automotive industry is highly competitive. BHA faces competition from other large public and private dealership individual franchised dealerships and competition via the Internet. Given the pricing transparency available via the Internet, and the f dealers acquire vehicles from the manufacturers on the same terms irrespective of volume, the location and quality of the dealership service and transaction speed are key differentiators in attracting customers.

BHA’s overall relationships with the automobile manufacturers are governed by framework agreements. The framework ag provisions relating to the management, operation, acquisition and the ownership structure of BHA’s dealerships. Failure to meet th agreements could adversely impact BHA’s ability to acquire additional dealerships representing those manufacturers. Additionally, contain limitations on the number of dealerships from a specific manufacturer that may be owned by BHA.

Individual dealerships operate under franchise agreements with the manufacturer, which grants the dealership entity a non-ex the manufacturer's brand of vehicles and offer related parts and service within a specified market area, as well as the right to use th trademarks. The agreements contain various requirements and restrictions related to the management and operation of the franchis provide for termination of the agreement by the manufacturer or non-renewal for a variety of causes. The states generally have auto franchise laws that provide substantial protection to the franchisee, and it is difficult for a manufacturer to terminate or not renew a fi outside of bankruptcy or with "good cause" under the applicable state franchise law.

BHA owns facilities with approximately 6.5 million square feet of space and approximately 950 acres of land that are utilize BHA also develops, underwrites and administers various vehicle protection plans as well as life and accident and health insuranc consumers through BHA's dealerships and third party dealerships. BHA also develops proprietary training programs and material ongoing monitoring and training of the dealership's finance and insurance personnel.

Home furnishings retailing

The home furnishings businesses consist of Nebraska Furniture Mart ("NFM"), R.C. Willey Home Furnishings ("R.C. Wille Company ("Star") and Jordan's Furniture, Inc. ("Jordan's"). These businesses offer a wide selection of furniture, bedding and access NFM and R.C. Willey sell a full line of major household appliances, electronics, computers and other home furnishings and offer cus complement their retail operations. An important feature of each of these businesses is their ability to control costs and to produce hi by offering significant value to their customers.

NFM operates its business from three large retail complexes, which include warehouse and administrative facilities in Omaha City, Kansas and The Colony, Texas a suburb of Dallas, which opened in 2015. These three sites include approximately 1.5 million s space. NFM is the largest furniture retailer in each of these markets. NFM also owns Homemakers Furniture located in Des Moines approximately 215,000 square feet of retail space. R.C. Willey, based in Salt Lake City, Utah, is the dominant home furnishings Intermountain West region of the United States. R.C. Willey currently operates 12 retail stores and three distribution centers. These approximately 1.5 million square feet of retail space with six stores located in Utah, one store in Idaho, three stores in Nevada ar California.

Jordan's operates a retail furniture business from six locations with approximately 770,000 square feet of retail space in s Massachusetts, New Hampshire, Rhode Island and Connecticut. The retail stores are supported by an 800,000 square foot distributio Massachusetts. Jordan's is the largest furniture retailer, as measured by sales, in Massachusetts and New Hampshire. Jordan's is w markets for its unique store arrangements and advertising campaigns. Star's retail facilities include about 700,000 square feet of r locations in Texas with eight in Houston. Star maintains a dominant position in each of its markets.

Other retailing

Borsheim Jewelry Company, Inc. ("Borsheims") operates from a single store in Omaha, Nebraska. Borsheims is a high volu jewelry, watches, crystal, china, stemware, flatware, gifts and collectibles. Helzberg's Diamond Shops, Inc. ("Helzberg") is based in Missouri, and operates a chain of 217 retail jewelry stores in 36 states, which includes approximately 500,000 square feet of retail s stores are located in malls, lifestyle centers, power strip centers and outlet malls, and all stores operate under the name *Helzberg Dia Diamonds Outlet*®. The Ben Bridge Corporation ("Ben Bridge Jeweler"), based in Seattle, Washington, operates a chain of 95 upsc stores located in 11 states primarily in the Western United States and in British Columbia, Canada. Forty-six of its retail locations are sell only PANDORA jewelry. Principal products include finished jewelry and timepieces. Ben Bridge Jeweler stores are located pr shopping malls.

See's Candies ("See's") produces boxed chocolates and other confectionery products with an emphasis on quality and disti large kitchens in Los Angeles and San Francisco and one smaller facility in Burlingame, California. See's operates approximately 25 discount stores located mainly in California and other Western states. See's revenues are highly seasonal with nearly half of its annu in the fourth quarter.

The Pampered Chef, Ltd. ("Pampered Chef") is a premier direct seller of distinctive high quality kitchenware products with United States, Canada and Germany. Pampered Chef's product portfolio consists of approximately 400 Pampered Chef® branded ki categories ranging from stoneware and cutlery to grilling and entertaining. Pampered Chef's products are available online as well a force of independent cooking consultants.

Oriental Trading Company ("OTC") is a leading multi-channel retailer and online destination for value-priced party supplies, and novelties, school supplies, educational games, patient giveaways and personalized products. OTC, headquartered in Omaha, N broad base of nearly four million customers annually, including consumers, schools, churches, non-profit organizations, medical and other businesses. OTC offers a unique assortment of over 50,000 fun products on its websites, including its flagship orientaltrading.c sophisticated digital and print marketing efforts to drive significant traffic and industry leading customer satisfactio

In April 2015, Berkshire acquired Detlev Louis Motorrad ("Louis") which is headquartered in Hamburg, Germany. Louis is a motorcycle apparel and equipment in Europe. Louis carries over 32,000 different products from more than 600 manufacturers, prim clothing, technical equipment and leisure markets. Louis has over 80 stores in Germany, Austria and Switzerland and also sells throu the Internet throughout most of Europe.

Additional information with respect to Berkshire's businesses

Revenue, earnings before taxes and identifiable assets attributable to Berkshire's reportable business segments are include Berkshire's Consolidated Financial Statements contained in Item 8, Financial Statements and Supplementary Data. Additional infor Berkshire's investments in fixed maturity and equity securities is included in Notes 3 and 4, respectively, to Berkshire's Consolid Statements.

Since June 2013, Berkshire has maintained a significant investment in H.J. Heinz Holding Corporation (now The Kraft H Information concerning this investment is included in Note 5 to Berkshire's Consolidated Financial Statements. Kraft Heinz is one and beverage companies in the world, with sales in approximately 190 countries and territories. Kraft Heinz manufactures and m beverage products, including condiments and sauces, cheese and dairy meals, meats, refreshment beverages, coffee and other gro throughout the world, under a host of iconic brands including *Heinz, Kraft, Oscar Mayer, Philadelphia, Velveeta, Lunchables, Plante Capri Sun, Ore-Ida, Kool-Aid and Jell-O*.

Berkshire maintains a website (*http://www.berkshirehathaway.com*) where its annual reports, certain corporate governance releases, interim shareholder reports and links to its subsidiaries' websites can be found. Berkshire's periodic reports filed with the S Form 10-K, Form 10-Q, Form 8-K and amendments thereto, may be accessed by the public free of charge from the SEC and thro Electronic copies of these reports can be accessed at the SEC's website (*http://www.sec.gov*) and indirectly through Berkshire's *www.berkshirehathaway.com*). Copies of these reports may also be obtained, free of charge, upon written request to: Berkshire Hat Farnam Street, Omaha, NE 68131, Attn: Corporate Secretary.

Item 1A. Risk Factors

Berkshire and its subsidiaries (referred to herein as "we," "us," "our" or similar expressions) are subject to certain risks and business operations which are described below. The risks and uncertainties described below are not the only risks we face. Addit uncertainties that are presently unknown or are currently deemed immaterial may also impair our business operatio

We are dependent on a few key people for our major investment and capital allocation decisions.

Major investment decisions and all major capital allocation decisions are made by Warren E. Buffett, Chairman of the Boar Chief Executive Officer, age 88, in consultation with Charles T. Munger, Vice Chairman of the Board of Directors, age 95. If for any of our key personnel, particularly Mr. Buffett, were to become unavailable, there could be a material adverse effect on our operat Berkshire's Board of Directors has identified certain current Berkshire subsidiary managers who, in their judgment, are capable Mr. Buffett and has agreed on a replacement for Mr. Buffett should a replacement be needed currently. The Board continually mon could alter its current view regarding a replacement for Mr. Buffett in the future. We believe that the Board's succession plan, to outstanding managers running our numerous and highly diversified operating units helps to mitigate this risk. In 2018, Berkshire's appointed Mr. Gregory Abel as Vice Chairman of Berkshire's non-insurance operations and Mr. Ajit Jain as Vice Chairman of Berk operations. Mr. Abel and Mr. Jain each report directly to Mr. Buffett and Mr. Buffett continues to be responsible for major capita investment decisions.

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We need qualified personnel to manage and operate our various businesses.

In our decentralized business model, we need qualified and competent management to direct day-to-day business activities subsidiaries and to manage changes in future business operations due to changing business or regulatory environments. Our operatin need qualified and competent personnel in executing their business plans and serving their customers, suppliers and other stakeholde recruit and retain qualified and competent managers and personnel could negatively affect the operating results, financial condition a subsidiaries and Berkshire as a whole.

Investments are unusually concentrated and fair values are subject to loss in value.

We concentrate a high percentage of the investments of our insurance subsidiaries in a relatively small number of equity secu our investment portfolios far less than is conventional in the insurance industry. A significant decline in the fair values of our large equity securities may produce a material decline in our consolidated shareholders' equity and our consolidated statement of

Since a large percentage of our equity securities are held by our insurance subsidiaries, significant decreases in the fair v investments will produce significant declines in their statutory surplus. Our large statutory surplus is a competitive advantage, and a decline could have an adverse effect on our claims-paying ability ratings and our ability to write new insurance business thus potent future underwriting profits.

Competition and technology may erode our business franchises and result in lower earnings.

Each of our operating businesses face intense competition within markets in which they operate. While we manage our bus objective of achieving long-term sustainable growth by developing and strengthening competitive advantages, many factors, includ changes, may erode or prevent the strengthening of competitive advantages. Accordingly, our future operating results will depend to s operating units successfully protecting and enhancing their competitive advantages. If our operating businesses are unsuccessful in periodic operating results in the future may decline.

Deterioration of general economic conditions may significantly reduce our operating earnings and impair our ability to acces at a reasonable cost.

Our operating businesses are subject to normal economic cycles, which affect the general economy or the specific industri operate. Significant deteriorations of economic conditions over a prolonged period could produce a material adverse effect on one significant operations. In addition, our utilities and energy businesses and our railroad business regularly utilize debt as a compone structures, and depend on having access to borrowed funds through the capital markets at reasonable rates. To the extent that acce markets is restricted or the cost of funding increases, these operations could be adversely affected.

Terrorist acts could hurt our operating businesses.

A successful (as defined by the aggressor) cyber, biological, nuclear or chemical attack could produce significant losses to operations. Our business operations could be adversely affected from such acts through the loss of human resources or destructio facilities and information systems. We share the risk with all businesses.

Regulatory changes may adversely impact our future operating results.

Over time, in response to financial markets crises, global economic recessions, and social and environmental issues, regulato adopted in the United States and elsewhere. Such initiatives addressed for example, the regulation of banks and other major financi environmental and global-warming matters. These initiatives impact all of our businesses, albeit in varying ways. Increased regulator could have a significant negative impact on our operating businesses, as well as on the businesses in which we have a significant, b economic interests. We cannot predict whether such initiatives will have a material adverse impact on our consolidated financial po operations or cash flows.

Data privacy regulations have recently been enacted in various jurisdictions in the U.S. and throughout the world. These reg numerous aspects related to the security of personal information that is stored in our information systems, networks and facilities. F with these regulations could result in reputational damage and significant penalties.

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Cyber security risks

We rely on technology in virtually all aspects of our business. Like those of many large businesses, certain of our information subject to computer viruses, malicious codes, unauthorized access, phishing efforts, denial-of-service attacks and other cyber attacks subject to similar attacks in the future as such attacks become more sophisticated and frequent. A significant disruption or failure o systems could result in service interruptions, safety failures, security events, regulatory compliance failures, an inability to protect assets against unauthorized users, and other operational difficulties. Attacks perpetrated against our systems could result in loss of information and expose us to remediation costs and reputational damage.

Although we have taken steps intended to mitigate these risks, including business continuity planning, disaster recovery plan impact analysis, a significant disruption or cyber intrusion could adversely affect our results of operations, financial condition Additionally, if we are unable to acquire, develop, implement, adopt or protect rights around new technology, we may suffer a compe which could also have an adverse effect on our results of operations, financial condition and liquidity.

Cyber attacks could further adversely affect our ability to operate facilities, information technology and business systems, confidential customer and employee information. Political, economic, social or financial market instability or damage to or interf operating assets, customers or suppliers from cyber attacks may result in business interruptions, lost revenues, higher commodity pr fuel supplies, lower energy consumption, unstable markets, increased security, repair or other costs, or may materially adversely aff cannot be predicted at this time. Any of these risks could materially affect our consolidated financial results. Furthermore, instabilit markets resulting from terrorism, sustained or significant cyber attacks, or war could also have a material adverse effect on our abili We share these risks with all businesses.

Derivative contracts may require significant cash settlement payments and result in significant losses in the fut

Over ten years ago, we assumed the risk of potentially significant losses under a number of equity index put option contrac remaining at year end 2018 will expire from 2019 through 2025. Risks of losses under these contracts are based on declines in equit comprising certain major U.S. and international stock indexes. We received considerable cash premiums as compensation for acce Absent major reductions in future equity securities prices, our ultimate payment obligations are not likely to be significant. Neverthel assurance that equity securities prices will not decline significantly resulting in settlement payments that significantly exceed the yea value of the contracts ($1.7 billion), recorded fair value ($2.45 billion) or the premiums we received at inception ($4.0 b

Risks unique to our regulated businesses

Our tolerance for risk in our insurance businesses may result in significant underwriting losses.

When properly paid for the risk assumed, we have been and will continue to be willing to assume more risk from a single ev insurer has knowingly assumed. Accordingly, we could incur a significant loss from a single event. We may also write coverages for acts of terrorism. We attempt to take into account all possible correlations and avoid writing groups of policies from which pre-tax lo event might aggregate above $10 billion. Currently, we estimate that our aggregate exposure from a single event under outstand significantly below $10 billion. However, despite our efforts, losses may aggregate in unanticipated ways. Our tolerance for significa may result in lower reported earnings in a future period.

The degree of estimation error inherent in the process of estimating property and casualty insurance loss reserves may resu underwriting losses.

The principal cost associated with the property and casualty insurance business is claims. In writing property and casualty ins receive premiums today and promise to pay covered losses in the future. However, it will take decades before all claims that have o given balance sheet date will be reported and settled. Although we believe that liabilities for unpaid losses are adequate, we will not k liabilities or the premiums charged for the coverages provided were sufficient until well after the balance sheet date. Estimating insu inherently imprecise. Our estimated unpaid losses arising under contracts covering property and casualty insurance risks are large December 31, 2018), and a small percentage increase to those liabilities can result in materially lower reported earnin

Changes in regulations and regulatory actions can adversely affect our operating results and our ability to allocate

Our insurance businesses are subject to regulation in the jurisdictions in which we operate. Such regulations may relate to a the types of business that can be written, the rates that can be charged for coverage, the level of capital that must be maintained, and types and size of investments that can be made. Regulations may also restrict the timing and amount of dividend payments to Be businesses. Accordingly, changes in regulations related to these or other matters or regulatory actions imposing restrictions on our in may adversely impact our results of operations and restrict our ability to allocate capital.

Our railroad business conducted through BNSF is also subject to a significant number of laws and regulations with respect to taxes, railroad operations and a variety of health, safety, labor, environmental and other matters. Failure to comply with applicable la could have a material adverse effect on BNSF's business. Governments may change the legislative and/or regulatory framework wi operates, without providing any recourse for any adverse effects that the change may have on the business. For example, enacted f mandated the implementation of positive train control ("PTC") technology by December 31, 2018, on certain mainline track whe commuter passenger railroads operate and where toxic-by-inhalation ("TIH") hazardous materials are transported. Due to the Fe Administration's ("FRA") interpretation of the PTC mandate as requiring all railroads that run on our tracks to be compliant before compliant, the FRA has confirmed an extension of the deadline for the Company to December 31, 2020. Complying with legislativ changes may pose significant operating and implementation risks and require significant capital expenditures.

BNSF derives significant amounts of revenue from the transportation of energy-related commodities, particularly coal. To changes in government policies limit or restrict the usage of coal as a source of fuel in generating electricity or alternate fuels, suc displace coal on a competitive basis, revenues and earnings could be adversely affected. As a common carrier, BNSF is also require chemicals and other hazardous materials. A release of hazardous materials could expose BNSF to significant claims, losses, penalties remediation obligations. Changes in the regulation of the rail industry could negatively impact BNSF's ability to determine prices for make capital improvements to its rail network, resulting in an adverse effect on our results of operations, financial condition

Our utilities and energy businesses operated under BHE are highly regulated by numerous federal, state, local and foreign authorities in the jurisdictions in which they operate. These laws and regulations are complex, dynamic and subject to new interpre Regulations affect almost every aspect of our utilities and energy businesses. Regulations broadly apply and may limit managem independently make and implement decisions regarding numerous matters including: acquiring businesses; constructing, acquirin operating assets; operating and maintaining generating facilities and transmission and distribution system assets; complying with p integrity and environmental requirements; setting rates charged to customers; establishing capital structures and issuing debt or e transacting between our domestic utilities and our other subsidiaries and affiliates; and paying dividends or similar distributions. Fail or reinterpretations of existing regulations and new legislation or regulations, such as those relating to air and water quality, rene standards, emissions performance standards, climate change, coal combustion byproduct disposal, hazardous and solid waste disposa and other environmental matters, or changes in the nature of the regulatory process may have a significant adverse impact on our

Our railroad business requires significant ongoing capital investment to improve and maintain its railroad network so that tra can be safely and reliably provided to customers on a timely basis. Our utilities and energy businesses also require significant amo construct, operate and maintain generation, transmission and distribution systems to meet their customers' needs and reliability crit system assets may need to be operational for long periods of time in order to justify the financial investment. The risk of operational of capital projects is not necessarily recoverable through rates that are charged to customers. Further, a significant portion of c improvements are funded through debt issued by BNSF and BHE and their subsidiaries. Disruptions in debt capital markets that funding when needed could adversely affect the results of operations, liquidity and capital resources of these busines

Item 1B. Unresolved Staff Comments

None.

Item 2. Description of Properties

The properties used by Berkshire's business segments are summarized in this section. Berkshire's railroad and utilities and en particular, utilize considerable physical assets in their businesses.

Railroad Business—Burlington Northern Santa Fe

Through BNSF Railway, BNSF operates approximately 32,500 route miles of track (excluding multiple main tracks, yard tra 28 states, and also operates in three Canadian provinces. BNSF owns over 23,000 route miles, including easements, and operates ove of trackage rights that permit BNSF to operate its trains with its crews over other railroads' tracks. The total BNSF system, including main tracks, yard tracks and sidings, consists of over 50,000 operated miles of track, all of which are owned by or held under easeme for over 10,000 miles operated under trackage rights.

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BNSF operates various facilities and equipment to support its transportation system, including its infrastructure, locomotives also owns or leases other equipment to support rail operations, such as vehicles. Support facilities for rail operations include yard throughout its rail network, system locomotive shops to perform locomotive servicing and maintenance, a centralized network operat dispatching and network operations monitoring and management in Fort Worth, Texas, regional dispatching centers, computers, tel equipment, signal systems and other support systems. Transfer facilities are maintained for rail-to-rail as well as intermodal transf trailers and other freight traffic and include approximately 25 intermodal hubs located across the system. BNSF owns or holds und leases exceeding one year approximately 8,000 locomotives and 70,000 freight cars, in addition to maintenance of way and oth

In the ordinary course of business, BNSF makes significant capital investments to expand and improve its railroad networ significant costs in repairing and maintaining its properties. In 2018, BNSF recorded approximately $2 billion in repairs and main

Utilities and Energy Businesses—Berkshire Hathaway Energy

BHE's energy properties consist of the physical assets necessary to support its electricity and natural gas businesses. Prope electricity businesses include electric generation, transmission and distribution facilities, as well as coal mining assets that support electric generating facilities. Properties of BHE's natural gas businesses include natural gas distribution facilities, interstate pipelines compressor stations and meter stations. The transmission and distribution assets are primarily within each of BHE's utility service ter to these physical assets, BHE has rights-of-way, mineral rights and water rights that enable BHE to utilize its facilities. Pursuant to agreements, a majority of these properties are pledged or encumbered to support or otherwise provide the security for the related sub or its affiliates own or have interests in the following types of electric generating facilities at December 31, 2018:

Energy Source	Entity	Location by Significance	F Ca (M
Natural gas	PacifiCorp, MEC, NV Energy and BHE Renewables	Nevada, Utah, Iowa, Illinois, Washington, Oregon, Texas, New York, and Arizona	1
Coal	PacifiCorp, MEC and NV Energy	Wyoming, Iowa, Utah, Arizona, Nevada, Colorado and Montana	1
Wind	PacifiCorp, MEC and BHE Renewables	Iowa, Wyoming, Texas, Nebraska, Washington, California, Illinois, Oregon and Kansas	
Solar	BHE Renewables and NV Energy	California, Texas, Arizona, Minnesota and Nevada	
Hydroelectric	PacifiCorp, MEC and BHE Renewables	Washington, Oregon, The Philippines, Idaho, California, Utah, Hawaii, Montana, Illinois and Wyoming	
Nuclear	MEC	Illinois	
Geothermal	PacifiCorp and BHE Renewables	California and Utah	
		Total	4

(1) *Facility Net Capacity (MW) represents the lesser of nominal ratings or any limitations under applicable interconnection, power agreements for intermittent resources and the total net dependable capability available during summer conditions for all other un resource's nominal rating is the manufacturer's contractually specified capability (in MW) under specified conditions. Net Owned BHE's ownership of Facility Net Capacity.*

As of December 31, 2018, BHE's subsidiaries also have electric generating facilities that are under construction in Iowa and total Facility Net Capacity and Net Owned Capacity of 2,390 MW.

PacifiCorp, MEC and NV Energy own electric transmission and distribution systems, including approximately 24,800 mile lines and approximately 1,690 substations, gas distribution facilities, including approximately 27,400 miles of gas mains and serv estimated 25 million tons of recoverable coal reserves in mines owned or leased in Wyoming and Colorado.

The electricity distribution network of Northern Powergrid (Northeast) and Northern Powergrid (Yorkshire) includes approxim of overhead lines, approximately 42,300 miles of underground cables and approximately 780 major substations. AltaLink's electri system includes approximately 8,200 miles of transmission lines and approximately 310 substations.

Northern Natural's pipeline system consists of approximately 14,700 miles of natural gas pipelines, including approximate mainline transmission pipelines and approximately 8,400 miles of branch and lateral pipelines. Northern Natural's end-use and distri includes points in Iowa, Nebraska, Minnesota, Wisconsin, South Dakota, Michigan and Illinois and its natural gas supply and deli includes points in Kansas, Texas, Oklahoma and New Mexico. Storage services are provided through the operation of one undergr storage field in Iowa, two underground natural gas storage facilities in Kansas and two liquefied natural gas storage peaking units, o in Minnesota.

Kern River's system consists of approximately 1,700 miles of natural gas pipelines, including approximately 1,400 miles of including 100 miles of lateral pipelines, and approximately 300 miles of common facilities. Kern River owns the entire mainline sect from the system's point of origination in Wyoming through the Central Rocky Mountains into California.

Other Segments

The physical properties used by Berkshire's other significant business segments are summarized below:

Business	Country	Locations	Property/Facility type	Number of Properties Owned	Number of Properties Leased
Insurance:					
GEICO	U.S.	Locations in 39 states	Offices and claims centers	12	108
	Non-U.S.	Locations in one country	Offices	—	2
BHRG	U.S.	Locations in 15 states	Offices	1	28
	Non-U.S.	Locations in 23 countries	Offices	1	35
BH Primary	U.S.	Locations in 23 states	Offices	9	79
	Non-U.S.	Locations in 8 countries	Offices	—	12
Manufacturing	U.S.	Locations in 48 states	Manufacturing facility	543	167
			Offices/Warehouses	240	443
			Retail/Showroom	225	226
			Housing communities	280	—
	Non-U.S.	Locations in 65 countries	Manufacturing facility	241	172
			Offices/Warehouses	59	540
			Retail/Showroom	—	5
Service	U.S.	Locations in 38 states	Training facilities/Hangars	19	130
			Offices/Distribution	52	207
			Production facilities	24	3
			Leasing/Showroom/Retail	40	91
	Non-U.S.	Locations in 34 countries	Training facilities/Hangars	18	35
			Offices/Distribution	—	115
			Leasing/Showroom/Retail	—	1
McLane Company	U.S.	Locations in 28 states	Distribution centers/Offices	57	33
Retailing	U.S.	Locations in 42 states	Offices/Warehouses	32	27
			Retail/Showroom	143	564
	Non-U.S.	Locations in 6 countries	Offices/Warehouses	1	12
			Retail/Offices	—	87

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Item 3. Legal Proceedings

Berkshire and its subsidiaries are parties in a variety of legal actions that routinely arise out of the normal course of busines actions seeking to establish liability directly through insurance contracts or indirectly through reinsurance contracts issued by Berk Plaintiffs occasionally seek punitive or exemplary damages. We do not believe that such normal and routine litigation will have a ma financial condition or results of operations. Berkshire and certain of its subsidiaries are also involved in other kinds of legal action assert or may assert claims or seek to impose fines and penalties. We believe that any liability that may arise as a result of other pen will not have a material effect on our consolidated financial condition or results of operations.

Item 4. Mine Safety Disclosures

Information regarding the Company's mine safety violations and other legal matters disclosed in accordance with Section 15 Frank Reform Act is included in Exhibit 95 to this Form 10-K.

Executive Officers of the Registrant

Following is a list of the Registrant's named executive officers:

Name	Age	Position with Registrant	Since
Warren E. Buffett	88	Chairman and Chief Executive Officer	1970
Charles T. Munger	95	Vice Chairman	1978
Gregory E. Abel	56	Vice Chairman – Non-Insurance Operations	2018
Ajit Jain	67	Vice Chairman – Insurance Operations	2018
Marc D. Hamburg	69	Senior Vice-President – Chief Financial Officer	1992

Each executive officer serves, in accordance with the by-laws of the Registrant, until the first meeting of the Board of Direc next annual meeting of shareholders and until a successor is chosen and qualified or until such executive officer sooner dies, resig becomes disqualified.

FORWARD-LOOKING STATEMENTS

Investors are cautioned that certain statements contained in this document as well as some statements in periodic press relea statements of Berkshire officials during presentations about Berkshire or its subsidiaries are "forward-looking" statements within t Private Securities Litigation Reform Act of 1995 (the "Act"). Forward-looking statements include statements which are predictive depend upon or refer to future events or conditions, which include words such as "expects," "anticipates," "intends," "plans," "believ similar expressions. In addition, any statements concerning future financial performance (including future revenues, earnings or gro business strategies or prospects and possible future Berkshire actions, which may be provided by management, are also forward-loo defined by the Act. Forward-looking statements are based on current expectations and projections about future events and are su uncertainties and assumptions about Berkshire and its subsidiaries, economic and market factors and the industries in which we do other things. These statements are not guarantees of future performance and we have no specific intention to update these s

Actual events and results may differ materially from those expressed or forecasted in forward-looking statements due to a nu principal risk factors that could cause our actual performance and future events and actions to differ materially from such forward-l include, but are not limited to, changes in market prices of our investments in fixed maturity and equity securities, losses realized contracts, the occurrence of one or more catastrophic events, such as an earthquake, hurricane, act of terrorism or cyber attack that ca by our insurance subsidiaries and/or losses to our business operations, changes in laws or regulations affecting our insurance, railr energy and finance subsidiaries, changes in federal income tax laws, and changes in general economic and market factors that aff securities or the industries in which we do business.

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Part II

Item 5. Market for Registrant's Common Equity, Related Security Holder Matters and Issuer Purchases of Equity Securities

Market Information

Berkshire's Class A and Class B common stock are listed for trading on the New York Stock Exchange, trading symbol: BR respectively.

Shareholders

Berkshire had approximately 2,000 record holders of its Class A common stock and 19,500 record holders of its Class B c February 15, 2019. Record owners included nominees holding at least 417,000 shares of Class A common stock and 1,374,000,000 common stock on behalf of beneficial-but-not-of-record owners.

Dividends

Berkshire has not declared a cash dividend since 1967.

Common Stock Repurchase Program

For several years, Berkshire had a common stock repurchase program, which permitted Berkshire to repurchase its Class A ar prices no higher than a 20% premium over the book value of the shares. On July 17, 2018, Berkshire's Board of Directors authorized the program, permitting Berkshire to repurchase shares any time that Warren Buffett, Berkshire's Chairman of the Board and Chief and Charles Munger, Vice Chairman of the Board, believe that the repurchase price is below Berkshire's intrinsic value, conservati Repurchases may be in the open market or through privately negotiated transactions. Information with respect to Berkshire's Clas common stock repurchased during the fourth quarter of 2018 follows.

Period	Total number of shares purchased	Average price paid per share	Total number of shares purchased as part of publicly announced program	Maximum number or value of shares that yet may be repurchased under the program
October 11 through October 18:				
Class A common stock	202	$ 310,762.79	202	*
Class B common stock	589,955	$ 205.09	589,955	*
December 13 through December 24:				
Class A common stock	790	$ 295,953.99	790	*

* *The program does not specify a maximum number of shares to be repurchased or obligate Berkshire to repurchase any specific number of Class A or Class B shares and there is no expiration date to the repurchase program. Berkshire will not repurchase its c repurchases reduce the total value of Berkshire's consolidated cash, cash equivalents and U.S. Treasury Bills holdings to less t*

Market for Registrant's Common Equity, Related Security Holder Matters and Issuer Purchases of Equity Securities

Stock Performance Graph

The following chart compares the subsequent value of $100 invested in Berkshire common stock on December 31, 2013
investment in the Standard & Poor's 500 Stock Index and in the Standard & Poor's Property – Casualty Insurance Inde

LOGO

**Cumulative return for the Standard & Poor's indices based on reinvestment of dividends.*

** *It would be difficult to develop a peer group of companies similar to Berkshire. The Corporation owns subsidiaries engaged in a business activities of which the most important is the property and casualty insurance business and, accordingly, managemen Standard & Poor's Property—Casualty Insurance Index for comparative purposes.*

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Item 6. Selected Financial Data

Selected Financial Data for the Past Five Years
(dollars in millions except per-share data)

	2018	2017	2016	20
Revenues:				
Insurance premiums earned	$ 57,418	$ 60,597	$ 45,881	$ 41
Sales and service revenues	133,336	130,243	123,053	110
Leasing revenue	5,732	2,552	2,553	1,
Railroad, utilities and energy revenues	43,673	40,005	37,447	39
Interest, dividend and other investment income	7,678	6,536	6,180	6,
Total revenues	$ 247,837	$ 239,933	$ 215,114	$ 200
Investment and derivative gains/losses	$ (22,455)	$ 2,128	$ 8,304	$ 10
Earnings:				
Net earnings attributable to Berkshire Hathaway (1)	$ 4,021	$ 44,940	$ 24,074	$ 24
Net earnings per share attributable to Berkshire Hathaway shareholders (2)	$ 2,446	$ 27,326	$ 14,645	$ 14
Year-end data:				
Total assets	$ 707,794	$ 702,095	$ 620,854	$ 552
Notes payable and other borrowings:				
Insurance and other	34,975	40,409	42,559	26
Railroad, utilities and energy	62,515	62,178	59,085	57
Berkshire Hathaway shareholders' equity	348,703	348,296	282,070	254
Class A equivalent common shares outstanding, in thousands	1,641	1,645	1,644	1,
Berkshire Hathaway shareholders' equity per outstanding Class A equivalent common share	$ 212,503	$ 211,750	$ 171,542	$ 154

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(1) *Includes after-tax investment and derivative gains/losses of $(17.7) billion in 2018, $1.4 billion in 2017, $6.5 billion in 2016, $6.7 billion in 2015 and $3.3 billion in 2014. Beginning in 2018, investr changes in fair values of equity securities during the period. Previously, investment gains/losses of equity securities were recognized in earnings when securities were sold or were other-than-tempora 2017 includes a one-time net benefit of $29.1 billion attributable to the enactment of the Tax Cuts and Jobs Act of 2017.*

(2) *Represents net earnings per average equivalent Class A share outstanding. Net earnings per average equivalent Class B common share outstanding is equal to 1/1,500 of such amount.*

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Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

Results of Operations

Net earnings attributable to Berkshire Hathaway shareholders for each of the past three years are disaggregated in the tal
Amounts are after deducting income taxes and exclude earnings attributable to noncontrolling interests (in millions

	2018	2017	2016
Insurance – underwriting	$ 1,566	$ (2,219)	$ 1,370
Insurance – investment income	4,554	3,887	3,636
Railroad	5,219	3,959	3,569
Utilities and energy	2,621	2,033	2,230
Manufacturing, service and retailing	9,364	7,282	6,803
Investment and derivative gains/losses	(17,737)	1,377	6,497
Other	(1,566)	(485)	(31)
Tax Cuts and Jobs Act of 2017	—	29,106	—
Net earnings attributable to Berkshire Hathaway shareholders	$ 4,021	$ 44,940	$ 24,074

Through our subsidiaries, we engage in a number of diverse business activities. We manage our operating businesses o
decentralized basis. There are essentially no centralized or integrated business functions and there is minimal involvement by our cor
in the day-to-day business activities of the operating businesses. Our senior corporate management team participates in and is ultima
significant capital allocation decisions, investment activities and the selection of the Chief Executive to head each of the operating
business segment data (Note 26 to the accompanying Consolidated Financial Statements) should be read in conjunction with th

Beginning in 2018, our periodic net earnings include changes in unrealized gains and losses on our investments in equity
gains and losses are likely to be very significant given the size of our current holdings and the inherent volatility in securities prices.
changes in unrealized gains and losses pertaining to such investments were recorded in other comprehensive income. The new accou
no effect on our consolidated shareholders' equity.

After-tax earnings of our business operations in 2018 were favorably affected by lower U.S. income tax expense, primaril
reduction in the statutory U.S. corporate income tax rate from 35% to 21%. The effect of the lower U.S. statutory income tax rate
comparative after-tax earnings of our various business operations varied, reflecting the differences in the mix of earnings subject to i
tax credits and the effects of state and local income taxes.

Net earnings in 2017 included approximately $29.1 billion attributable to a one-time net benefit from the enactment of the
Act of 2017 ("TCJA") on December 22, 2017. See Note 18 to the Consolidated Financial Statements. This benefit included approxin
related to a one-time non-cash reduction of net deferred income tax liabilities from the reduction in the statutory U.S. corporate inc
35% to 21%, and a net benefit of approximately $900 million primarily attributable to our earnings from Kraft Heinz, partly offset by
tax expense of approximately $1.4 billion on the deemed repatriation of certain accumulated undistributed earnings of foreign subsic
significance, we presented these one-time effects as a distinct item in the preceding table. Accordingly, the after-tax figures present
discussion of our various operating businesses and other activities exclude the one-time effects of the TCJA.

After-tax earnings from insurance underwriting were approximately $1.6 billion in 2018 compared to after-tax losses of
$2.2 billion in 2017. Results in 2018 included reductions of estimated ultimate liabilities for prior years' property/casualty loss ev
foreign currency exchange rate changes on certain non-U.S. Dollar denominated liabilities of U.S subsidiaries of $207 million and
income tax rate, partly offset by losses from significant catastrophe events of approximately $1.6 billion ($1.3 billion after-tax). Aft
insurance underwriting in 2017 included estimated pre-tax losses of approximately $3.0 billion ($1.95 billion after-tax) from signif
events. Underwriting results in 2017 also included after-tax foreign currency exchange rate losses of $295 million

Our railroad business generated a 31.8% increase in after-tax earnings in 2018 compared to 2017, reflecting an increase in u
average revenue per car/unit and a lower effective income tax rate, partly offset by increased fuel and other operating costs. After-ta
railroad business in 2017 were $4.0 billion, an increase of 10.9% compared to 2016, reflecting increased unit volum

Our utilities and energy businesses produced higher after-tax earnings in 2018 compared to 2017, primarily due to a lower
income tax rate and the effects of losses incurred in 2017 in connection with the prepayment of certain long-term debt, partially offs
earnings in certain of the regulated utilities. After-tax earnings of our utility and energy businesses in 2017 declined $197 million c
reflecting the debt prepayment losses in 2017.

Management's Discussion and Analysis *(Continued)*

Results of Operations *(Continued)*

After-tax earnings in 2018 of our manufacturing, service and retailing businesses increased 29% over 2017, due to lower ef rates and a 13% increase in pre-tax earnings. After-tax earnings in 2017 of our manufacturing, service and retailing businesses wer increase of 7.0% compared to 2016, reflecting comparatively higher earnings from several of our larger operations and the impac acquired in 2016 and 2017.

After-tax losses from investments and derivative contracts were $17.7 billion in 2018, which included after-tax losses of $18 billion from changes in market values of our investments in equity securities held at December 31, 2018. Prior to 2018, after-tax losses on equity securities arose from the sale of securities during the period based on the cost of the disposed security or through the than-temporary impairment losses. In 2017, we recorded after-tax unrealized gains on our investments in equity securities of approxi in other comprehensive income.

After-tax investment and derivative gains were approximately $1.4 billion in 2017 and $6.5 billion in 2016. Investment gain approximately $2.7 billion from the redemptions of our Wrigley and Kraft Heinz preferred stock investments, and sales of Dow Ch stock we received in the conversion of the Dow Chemical preferred stock investment. Investment gains in 2016 also included a non- of approximately $1.9 billion related to the exchange of Procter & Gamble ("P&G") common stock for 100% of the common sto

We believe that investment and derivative gains/losses, whether realized from dispositions or unrealized from changes in equity securities, are generally meaningless in understanding our reported results or evaluating the economic performance of our busi and losses have caused and will continue to cause significant volatility in our periodic earnings.

Other earnings included after-tax foreign currency exchange rate gains of $289 million in 2018, losses of $655 million in 2 $159 million in 2016 related to parent company Euro-denominated debt. In addition, other earnings in 2018 included losses from investments due to Kraft Heinz, partly offset by earnings from other equity method investments. Other earnings in 2018 also reflecte income from short-term investments.

Insurance—Underwriting

Our management views our insurance businesses as possessing two distinct activities – underwriting and investing. Underw the responsibility of the unit managers, while investing decisions are the responsibility of Berkshire's Chairman and CEO, Warren Berkshire's corporate investment managers. Accordingly, we evaluate performance of underwriting operations without any allocati income or investment gains/losses. We consider investment income as a component of our aggregate insurance operating results. How investment gains and losses, whether realized or unrealized as non-operating, based on our long-held philosophy of acquiring secur those securities for long periods. Accordingly, we believe that such gains and losses are not necessarily meaningful in understandi results of our insurance operations.

The timing and amount of catastrophe losses can produce significant volatility in our periodic underwriting results, particul our reinsurance businesses. Generally, we consider catastrophe losses in excess of $100 million (pre-tax) from a current year event incurred estimated pre-tax losses of approximately $1.6 billion in 2018 and $3.0 billion in 2017 from significant catastroph

Changes in estimates for unpaid losses and loss adjustment expenses, including amounts established for occurrences in pri significantly affect our periodic underwriting results. Unpaid loss estimates, including estimates under retroactive reinsurance c approximately $110 billion as of December 31, 2018. Our periodic underwriting results may also include significant foreign currenc and losses arising from the changes in the valuation of non-U.S. Dollar denominated reinsurance liabilities of our U.S. based insuran to foreign currency exchange rate fluctuations.

We engage in both primary insurance and reinsurance of property/casualty, life and health risks. In primary insurance acti defined portions of the risks of loss from persons or organizations that are directly subject to the risks. In reinsurance activities, we portions of similar or dissimilar risks that other insurers or reinsurers have subjected themselves to in their own insuring activities. O reinsurance businesses are GEICO, Berkshire Hathaway Reinsurance Group ("BHRG") and Berkshire Hathaway Primary

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Underwriting results of our insurance businesses are summarized below (dollars in millions).

	2018	2017	2016
Underwriting gain (loss):			
GEICO	$ 2,449	$ (310)	$ 462
Berkshire Hathaway Reinsurance Group	(1,109)	(3,648)	1,012
Berkshire Hathaway Primary Group	670	719	657
Pre-tax underwriting gain (loss)	2,010	(3,239)	2,131
Income taxes and noncontrolling interests	444	(1,020)	761
Net underwriting gain (loss)	$ 1,566	$ (2,219)	$ 1,370
Effective income tax rate	21.4%	32.0%	34.8%

GEICO

GEICO writes private passenger automobile insurance, offering coverages to insureds in all 50 states and the District of C markets its policies mainly by direct response methods where most customers apply for coverage directly to the company via the In telephone. A summary of GEICO's underwriting results follows (dollars in millions).

	2018		2017		2016	
	Amount	%	Amount	%	Amount	%
Premiums written	$ 34,123		$ 30,547		$ 26,309	
Premiums earned	$ 33,363	100.0	$ 29,441	100.0	$ 25,483	100.0
Losses and loss adjustment expenses	26,278	78.8	25,497	86.6	21,044	82.6
Underwriting expenses	4,636	13.9	4,254	14.5	3,977	15.6
Total losses and expenses	30,914	92.7	29,751	101.1	25,021	98.2
Pre-tax underwriting gain (loss)	$ 2,449		$ (310)		$ 462	

Premiums written were $34.1 billion in 2018, an increase of 11.7% compared to 2017. The increase reflected voluntary aut growth of 3.3% and increased premiums per auto policy of approximately 6.4%. The increase in premiums per policy was attributab coverage changes and changes in state and risk mix. The rate increases were in response to accelerating claim costs in recent ye policies-in-force increased 540,000 during 2018, the rate of increase slowed, as voluntary auto new business sales decreased 4.7% c

Pre-tax underwriting gains in 2018 were $2,449 million compared to losses of $310 million in 2017. Underwriting results in effects of lower losses from significant catastrophe events and from prior years' loss events, as well as increased average premiu

Losses and loss adjustment expenses were $26.3 billion in 2018, an increase of $781 million (3.1%) compared to 2017. GEI and loss adjustment expenses to premiums earned (the "loss ratio") for 2018 was 78.8%, a decline of 7.8 percentage points compare from significant catastrophe events were $105 million in 2018 (Hurricanes Florence and Michael and the wildfires in California) an $450 million in 2017 (Hurricanes Harvey and Irma).

Losses and loss adjustment expenses regularly include gains or losses for the decreases or increases in the ultimate claim lo the period for prior years' loss events. These gains or losses produce corresponding increases or decreases to pre-tax underwriting gai and loss adjustment expenses included gains of $222 million in 2018 and losses of $517 million in 2017 with respect to prior year addition, claims frequencies in 2018 for property damage, collision, and bodily and personal injury protection coverages declined (t range) compared to 2017. Average claims severities in 2018 increased for property damage and collision coverages (four to six pe bodily injury coverage (five to seven percent range) versus 2017.

Management's Discussion and Analysis *(Continued)*

Insurance—Underwriting *(Continued)*

GEICO (Continued)

Underwriting expenses were approximately $4.6 billion in 2018, an increase of $382 million (9.0%) over 2017. GEICO (underwriting expenses to premiums earned) in 2018 was 13.9%, a decrease of 0.6 percentage points compared to 2017. The unde increase was primarily attributable to increases in advertising expenses, insurance premium taxes and employee-related costs, which staffing increases.

Premiums written were $30.5 billion in 2017, an increase of 16.1% over 2016, and premiums earned were $29.4 billion approximately $4.0 billion (15.5%). During 2017, our voluntary auto policies-in-force grew approximately 8.6% and premiums increased 6.9%. The increase in average premiums per policy was attributable to rate increases, coverage changes and changes in s Voluntary auto new business sales in 2017 increased 10.5% compared to 2016. Voluntary auto policies-in-force increased approxi during 2017.

Pre-tax underwriting losses in 2017 were $310 million compared to pre-tax gains of $462 million in 2016. Losses and loss a in 2017 increased approximately $4.5 billion (21.2%) compared to 2016. Our loss ratio in 2017 increased 4.0 percentage points com increase in losses incurred was attributable to increased average claims severities, losses from significant catastrophe events in 2017 losses with respect to prior years' loss events ($517 million). Average claims severities were higher in 2017 for property damage and (four to six percent range) and bodily injury coverage (five to seven percent range). Claims frequencies in 2017 were relatively unch 2016 for bodily injury coverage, decreased about one percent for property damage and collision coverages and decreased about two personal injury protection coverage. Underwriting expenses increased $277 million (7.0%) in 2017 compared to 2016. Our expen declined 1.1 percentage points compared to 2016.

Berkshire Hathaway Reinsurance Group

We offer excess-of-loss and quota-share reinsurance coverages on property and casualty risks and life and health reinsuran reinsurers worldwide through several subsidiaries, led by National Indemnity Company ("NICO"), Berkshire Hathaway Life Insur Nebraska ("BHLN") and General Reinsurance Corporation, General Reinsurance AG and General Re Life Corporation (collectively, also periodically assume property and casualty risks under retroactive reinsurance contracts written through NICO. In addition, w payment annuity contracts predominantly through BHLN.

With the exception of our retroactive reinsurance and periodic payment annuity businesses, we strive to generate pre-tax ur Time-value-of-money concepts are important elements in establishing prices for retroactive reinsurance and periodic payment annuit the expected long durations of the liabilities. We expect to incur pre-tax underwriting losses from such businesses, primarily throug amortization and discount accretion charges. We receive premiums at the inception of these contracts, which are then available fo summary of BHRG's premiums and pre-tax underwriting results follows (dollars in millions).

	Premiums written			Premiums earned			Pre-tax underwriting gain (loss		
	2018	2017	2016	2018	2017	2016	2018	2017	2
Property/casualty	$ 9,413	$ 7,713	$ 6,993	$ 8,928	$ 7,552	$ 7,218	$ (207)	$ (1,595)	$
Retroactive reinsurance	517	10,755	1,254	517	10,755	1,254	(778)	(1,330)	(
Life/health	5,446	4,846	4,588	5,343	4,808	4,587	216	(52)	
Periodic payment annuity	1,156	898	1,082	1,156	898	1,082	(340)	(671)	(
	$ 16,532	$ 24,212	$ 13,917	$ 15,944	$ 24,013	$ 14,141	$ (1,109)	$ (3,648)	$

Management's Discussion and Analysis *(Continued)*
Insurance—Underwriting *(Continued)*

Berkshire Hathaway Reinsurance Group (Continued)

Property/casualty

A summary of property/casualty reinsurance underwriting results follows (dollars in millions).

	2018		2017		2016	
	Amount	%	Amount	%	Amount	%
Premiums written	$ 9,413		$ 7,713		$ 6,993	
Premiums earned	$ 8,928	100.0	$ 7,552	100.0	$ 7,218	100.0
Losses and loss adjustment expenses	6,929	77.6	7,217	95.6	4,336	60.1
Underwriting expenses	2,206	24.7	1,930	25.5	1,987	27.5
Total losses and expenses	9,135	102.3	9,147	121.1	6,323	87.6
Pre-tax underwriting gain (loss)	$ (207)		$ (1,595)		$ 895	

Property/casualty premiums earned in 2018 were $8.9 billion, an increase of 18.2% compared to 2017, while premiums increased 4.6% compared to 2016. These increases were primarily attributable to higher direct and broker markets business, derived business and increased participations for renewal business in both property and casualty lines. Premiums earned included approxima both 2018 and 2017 and $1.7 billion in 2016 from a 10-year, 20% quota-share contract entered into by NICO with Insurance Austral which expires in 2025.

Losses and loss adjustment expenses in 2018 decreased $288 million (4.0%) compared to 2017, and the loss ratio declined 1 to 77.6%. Losses incurred from significant catastrophe events in 2018 were approximately $1.3 billion, which derived from Hurrica Michael, Typhoon Jebi and the wildfires in California, including $1.1 billion in the fourth quarter. Losses from significant catastrop were approximately $2.4 billion, which derived from Hurricanes Harvey, Irma and Maria, an earthquake in Mexico, a cyclone in Aus in California. There were no significant catastrophe loss events in 2016. In addition, losses and loss adjustment expenses reflect $469 million in 2018, $295 million in 2017 and $874 million in 2016 from reductions of estimated ultimate losses for prior years' eve 2018 was primarily due to lower than expected property losses. The net gain from prior years' loss events in 2017 reflected losses expected property claims and increases in certain United Kingdom ("U.K.") claim liabilities attributable to the U.K. Ministry of Ju reduce the fixed discount rate required in lump sum settlement calculations of personal injury claims from 2.5% to negativ

Retroactive reinsurance

Retroactive reinsurance premiums earned in 2018 were $517 million, which derived primarily from one contract. Premiur included $10.2 billion from an aggregate excess-of-loss retroactive reinsurance agreement with various subsidiaries of American In Inc. (the "AIG Agreement"). At the inception of our retroactive reinsurance contracts, we record the estimated ultimate claim liabil record the excess of such claim liabilities over the premiums received as a deferred charge asset. Thus, as of the inception dates of th is no net underwriting gain or loss. Deferred charge assets are subsequently amortized over the expected claim settlement period a adjustment expenses.

Pre-tax underwriting losses from retroactive reinsurance contracts were $778 million in 2018, $1,330 million in 2017 and $ Certain retroactive reinsurance liabilities of our U.S. subsidiaries are denominated in foreign currencies. Pre-tax underwriting results $169 million in 2018, losses of $264 million in 2017 and gains of $392 million in 2016 associated with the re-measurement of such currency exchange rate changes. Pre-tax underwriting losses before foreign currency gains/losses were $947 million in 2018, $1,066 $452 million in 2016, which derived from deferred charge amortization and changes in the estimated timing and amount of future Pre-tax underwriting losses related to the AIG Agreement were $611 million in 2018 and $527 million in 2017.

In 2018, we decreased estimated ultimate liabilities $341 million for prior years' retroactive reinsurance contracts, which a the related unamortized deferred charges from changes in the estimated timing and amount of the future claim payments, produced p gains of approximately $185 million. Changes in estimated ultimate liabilities for prior years' contracts had a relatively insignifican underwriting results in 2017 and 2016.

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Retroactive reinsurance (Continued)

Unpaid losses assumed under retroactive reinsurance contracts were approximately $41.8 billion at December 31, 2018 ar December 31, 2017. Deferred charge assets related to such contracts were approximately $14.1 billion at December 31, 2018 and December 31, 2017. Deferred charge assets will be charged to pre-tax earnings over the expected remaining claims settlement perioc amortization.

Life/health

A summary of our life/health reinsurance underwriting results follows (dollars in millions).

	2018		2017		2016	
	Amount	%	Amount	%	Amount	%
Premiums written	$ 5,446		$ 4,846		$ 4,588	
Premiums earned	$ 5,343	100.0	$ 4,808	100.0	$ 4,587	100.0
Life and health insurance benefits	4,226	79.1	4,276	88.9	3,644	79.4
Underwriting expenses	901	16.9	584	12.2	638	13.9
Total benefits and expenses	5,127	96.0	4,860	101.1	4,282	93.3
Pre-tax underwriting gain (loss)	$ 216		$ (52)		$ 305	

Life/health premiums earned were $5.3 billion, an increase of $535 million (11.1%) over 2017, which increased $221 millio to 2016. The increases in each year were primarily attributable to growth in the North America, Asia and Australia life insurance mar last three years, premiums earned of approximately $1.0 billion derived from a BHLN reinsurance contract with a major reinsu predominantly life risks in North America.

Our life/health business produced pre-tax underwriting gains of $216 million in 2018, losses of $52 million in 2017 and gai in 2016. The underwriting gains in 2018 reflected lower losses from the run-off of U.S. long-term care business, partially offset by lo run-off of variable annuity guarantee contracts. In the fourth quarter of 2017, we recorded pre-tax losses of $450 million from disco and changes in other actuarial assumptions associated with long-term care liabilities. Pre-tax gains from variable annuity guarantee $34 million in 2018, $256 million in 2017 and $231 million in 2016. Underwriting results from this business reflect changes in estin guaranteed benefits, which result from changes in securities markets and interest rates and from the periodic amortization of expect

Periodic payment annuity

Periodic payment annuity premiums earned in 2018 were $1,156 million, an increase of $258 million (28.7%) compared declined $184 million (17.0%) from 2016, reflecting a corresponding increase and decrease in new business volumes. Periodic payme sensitive, and the volume we write can change rapidly due to changes in prices, which are affected by prevailing interest rates, the p durations associated with the expected annuity payments, and the level of competition.

Periodic payment annuity contracts produced pre-tax losses of $340 million in 2018, $671 million in 2017 and $128 millio contracts written by our U.S. subsidiaries are denominated in foreign currencies and pre-tax underwriting results included gains of $9 losses of $190 million in 2017 and gains of $313 million in 2016 from the re-measurement of such liabilities due to changes in exch foreign currency gains and losses, pre-tax underwriting losses were $433 million in 2018, $481 million in 2017 and $441 million in primarily derived from the recurring discount accretion of annuity liabilities, as well as the impact of mortality and interest rate cha annuity liabilities approximated $12.5 billion at December 31, 2018 and $11.2 billion at December 31, 2017, reflecting a weighted av of approximately 4.1%.

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Management's Discussion and Analysis *(Continued)*

Insurance—Underwriting *(Continued)*

Berkshire Hathaway Primary Group

The Berkshire Hathaway Primary Group ("BH Primary") provides a variety of commercial insurance solutions, includ malpractice, workers' compensation, automobile, general liability, property and various specialty coverages for small, medium and largest of these insurers are Berkshire Hathaway Specialty Insurance ("BH Specialty"), Berkshire Hathaway Homestate Companies (Group, Berkshire Hathaway GUARD Insurance Companies ("GUARD"), and National Indemnity Company ("NICO Primary"). C insurers include U.S. Liability Insurance Company, Applied Underwriters, Central States Indemnity Company and MLMIC Insur acquired October 1, 2018. A summary of BH Primary underwriting results follows (dollars in millions).

	2018		2017		2016	
	Amount	%	Amount	%	Amount	%
Premiums written	$ 8,561		$ 7,483		$ 6,684	
Premiums earned	$ 8,111	100.0	$ 7,143	100.0	$ 6,257	100.0
Losses and loss adjustment expenses	5,261	64.9	4,511	63.1	3,864	61.8
Underwriting expenses	2,180	26.9	1,913	26.8	1,736	27.7
Total losses and expenses	7,441	91.8	6,424	89.9	5,600	89.5
Pre-tax underwriting gain	$ 670		$ 719		$ 657	

Premiums written and earned in 2018 increased 14.4% and 13.6%, respectively, compared to 2017. The increases in prem earned were primarily attributable to written premium growth at BH Specialty (32.5%), GUARD (19.4%), NICO Primary (14.0%) a Premiums written and earned in 2017 increased 12.0% and 14.2%, respectively, compared to 2016 reflecting written premium increa significant BH Primary insurers, led by GUARD (26%), BH Specialty (23%) and BHHC (9%).

BH Primary's loss ratios were 64.9% in 2018, 63.1% in 2017, and 61.8% in 2016. Losses and loss adjustment expenses inc significant catastrophe events of $190 million in 2018 from Hurricanes Florence and Michael and the wildfires in California and $2 from Hurricanes Harvey, Irma and Maria. Losses and loss adjustment expenses also included net gains from the reductions of est liabilities for prior years' loss events of $715 million in 2018, $766 million in 2017 and $503 million in 2016. The liability reducti primarily related to healthcare malpractice and workers' compensation business. BH Primary writes significant levels of commercia liability and workers' compensation insurance and the related claim costs may be subject to higher severity and longer claim-tails, wl to significant increases in claims liabilities in the future attributable to higher than expected claim settlements, adverse litigation ou rulings and other factors not currently anticipated.

Insurance—Investment Income

A summary of net investment income attributable to our insurance operations follows (dollars in millions)

	2018	2017	2016
Interest and other investment income	$ 1,851	$ 1,263	$ 930
Dividend income	3,652	3,592	3,552
Investment income before income taxes and noncontrolling interests	5,503	4,855	4,482
Income taxes and noncontrolling interests	949	968	846
Net investment income	$ 4,554	$ 3,887	$ 3,636
Effective income tax rate	17.2%	19.9%	18.8%

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Insurance—Investment Income *(Continued)*

Pre-tax interest and other investment income increased $588 million (46.6%) compared to 2017. The increase reflected th short-term interest rates in 2018 and higher other investment income, partly offset by lower interest from lower average investments securities. Our invested assets continue to include significant levels of short-term investments. We believe that maintaining ample liq and we insist on safety over yield with respect to such investments. Dividend income increased $60 million (1.7%) in 2018 as co reflecting the impact of increased investments in marketable equity securities and higher dividend rates, partially offset by Rest International's redemption of our $3 billion investment in 9% preferred stock in December 2017.

Pre-tax investment income increased $373 million (8.3%) in 2017 compared to 2016, attributable to higher interest rate investments and increased other investment income. Dividend income in 2017 was relatively unchanged compared to 2016 reflecting rates and increased overall investment levels, offset by the impact of the conversion of our $3 billion investment in Dow Chemical C 8.5% preferred stock into Dow common stock at the end of 2016. Prior to its conversion, we received dividends of $255 millio

Invested assets of our insurance businesses derive from shareholder capital, including reinvested earnings, and from net insurance and reinsurance contracts or "float." The major components of float are unpaid losses and loss adjustment expenses, includ retroactive reinsurance contracts, life, annuity and health insurance benefit liabilities, unearned premiums and other liabilities due to insurance premiums and reinsurance receivables, deferred charges assumed under retroactive reinsurance contracts and deferred polic Float approximated $123 billion at December 31, 2018, $114 billion at December 31, 2017, and $91 billion at December 3

The increase in float in 2018 reflected the effects of the acquisition of MLMIC and overall growth of our insurance operatio increase in float in 2017 reflected increases in loss adjustment expenses, including liabilities (net of deferred charges) assumed un reinsurance contracts written in 2017 and estimated liabilities related to catastrophe events, and overall growth of our insurance o combined insurance operations generated pre-tax underwriting earnings of approximately $2.0 billion in 2018, and consequently, th float for the period was negative. Pre-tax underwriting losses were approximately $3.2 billion in 2017 and our average cost of float w 3.0%.

A summary of cash and investments held in our insurance businesses as of December 31, 2018 and 2017 follows (in

	December 31, 2018	December 31, 2017
Cash, cash equivalents and U.S. Treasury Bills	$ 64,548	$ 73,285
Equity securities	166,385	163,134
Fixed maturity securities	19,690	21,092
	$ 250,623	$ 257,511

Fixed maturity investments as of December 31, 2018 were as follows (in millions).

	Amortized cost	Unrealized gains/losses	Carrying value
U.S. Treasury, U.S. government corporations and agencies	$ 4,213	$ —	$ 4,213
States, municipalities and political subdivisions	177	7	184
Foreign governments	7,478	22	7,500
Corporate bonds, investment grade	6,241	361	6,602
Corporate bonds, non-investment grade	664	26	690
Mortgage-backed securities	443	58	501
	$ 19,216	$ 474	$ 19,690

U.S. government obligations are rated AA+ or Aaa by the major rating agencies. Approximately 87% of all state, munici subdivisions, foreign government obligations and mortgage-backed securities were rated AA or higher. Non-investment grade sec securities rated below BBB- or Baa3. Foreign government securities include obligations issued or unconditionally guaranteed by nat government entities.

Management's Discussion and Analysis *(Continued)*

Railroad ("Burlington Northern Santa Fe")

Burlington Northern Santa Fe, LLC ("BNSF") operates one of the largest railroad systems in North America, with approxin miles of track in 28 states. BNSF also operates in three Canadian provinces. BNSF classifies its major business groups by type of pr include consumer products, coal, industrial products and agricultural products. A summary of BNSF's earnings follows (dollars

	2018	2017	2016
Revenues	$ 23,855	$ 21,387	$ 19,829
Operating expenses:			
Compensation and benefits	5,394	5,023	4,809
Fuel	3,346	2,518	1,934
Purchased services	2,870	2,514	2,418
Depreciation and amortization	2,317	2,352	2,128
Equipment rents, materials and other	2,024	1,636	1,855
Total operating expenses	15,951	14,043	13,144
Interest expense	1,041	1,016	992
	16,992	15,059	14,136
Pre-tax earnings	6,863	6,328	5,693
Income taxes	1,644	2,369	2,124
Net earnings	$ 5,219	$ 3,959	$ 3,569
Effective income tax rate	24.0%	37.4%	37.3%

2018 versus 2017

BNSF's revenues were $23.9 billion in 2018, representing an increase of $2.5 billion (11.5%) versus 2017. BNSF's revenue a 6.2% comparative increase in average revenue per car/unit and a 4.1% increase in volume. Combined volume was 10.7 million cars 10.3 million in 2017. The increase in average revenue per car/unit was attributable to increased rates per car/unit, higher fuel surcha by higher fuel prices, and business mix changes. Pre-tax earnings were approximately $6.9 billion in 2018, an increase of 8.5% co

Revenues from consumer products were $7.9 billion in 2018, an increase of 11.1% compared to 2017, reflecting higher av car/unit and volume increases of 2.9%. The volume increases were due to higher domestic intermodal volumes, primarily attribu economic growth and tight truck capacity leading to conversion from highway to rail, as well as growth in imports and containeri product exports, partially offset by a sizable contract loss.

Revenues from industrial products were $6.0 billion in 2018, an increase of 16.2% from 2017. The increase was attribut increases of 9.8% as well as higher average revenue per car/unit. Volumes in 2018 were higher primarily due to strength in the indu sectors, which drove higher demand for petroleum products, building products, construction products, and plastics

Revenues from agricultural products increased 8.8% in 2018 to $4.7 billion compared to 2017. The increase was due to h 9.0%, partially offset by slightly lower average revenue per car/unit. Volumes increased due to strong export and domestic corn shi higher fertilizer and other grain products volumes, partially offset by a reduction in soybean and wheat exports.

Revenues from coal in 2018 increased 4.3% to $4.0 billion compared to 2017, attributable to higher average revenue per offset by lower volumes of 0.8%. The volume decreases in 2018 were due mainly to utility plant retirements combined with compet gas and renewables, mostly offset by market share gains and improved export volumes.

Total operating expenses were $16.0 billion in 2018, an increase of $1.9 billion (13.6%) compared to 2017. Our ratio of op revenues increased 1.2 percentage points to 66.9% in 2018 versus 2017. Compensation and benefits expenses increased $371 millio to 2017. The increase was primarily due to wage inflation and increased headcount and associated training costs. Fuel expenses incr (32.9%) compared to 2017 primarily due to higher average fuel prices and increased volumes.

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Purchased services expense increased $356 million (14.2%) compared to 2017. The increase was due to higher purchased t of our logistics services business, as well as increased intermodal ramping, drayage, and other volume-related costs. Equipment re other expense increased $388 million (23.7%) compared to 2017. The increase resulted from higher locomotive material, personal derailment-related costs, and property taxes, as well as a benefit of the enactment of the TCJA on an equity method investe

BNSF's effective income tax rate was 24.0% for 2018 as compared to 37.4% for 2017 which excludes the effects of the TCJ the U.S. statutory income tax rate under the TCJA, effective January 1, 2018, drove most of the effective income tax rate

2017 versus 2016

BNSF's revenues were $21.4 billion in 2017, representing an increase of $1.6 billion (7.9%) versus 2016. Pre-tax earnings 2017 compared to 2016. During 2017, BNSF's revenues reflected a 2.4% comparative increase in average revenue per car/unit and volume. Combined volume was 10.3 million cars/units in 2017 compared to 9.8 million in 2016. The increase in average revenue primarily attributable to higher fuel surcharge revenue, increased rates per car/unit and business mix changes.

Revenues from consumer products were $7.1 billion in 2017, representing an increase of 8.8% compared to 2016, reflectin of 6.3% as well as higher average revenue per car/unit. The volume increases were primarily attributable to improving econom normalizing of retail inventories, new services and higher market share, which benefited domestic intermodal, international intermo volumes.

Revenues from industrial products were $5.1 billion in 2017, an increase of 7.7% from 2016, attributable to a volume incre as higher average revenue per car/unit. Volumes in 2017 were higher for sand and other commodities that support drilling. In a strengthening in the industrial sector drove greater demand for steel and taconite. These volume increases were partially offset by products volume due to pipeline displacement of U.S. crude rail traffic.

Revenues from agricultural products increased 1.8% to $4.3 billion in 2017 compared to 2016, primarily due to higher avera unit. Volumes were relatively flat, primarily due to higher shipments of domestic grain, ethanol and other grain products, offset by l

Revenues from coal increased 13.7% to $3.8 billion in 2017 compared to 2016. This increase reflected higher average reve well as 6.3% higher volumes. The volume increases in 2017 were due to the effects of higher natural gas prices, which led to incr usage. This was partially offset by the effects of unit retirements at coal generating facilities, increased renewable generation and adjustments at customer facilities.

Total operating expenses were $14.0 billion in 2017, an increase of $899 million (6.8%) compared to 2016. Our ratio of op revenues decreased 0.6 percentage points to 65.7% in 2017 versus 2016. Compensation and benefits expenses increased $214 millio to 2016. The increase was primarily due to higher health and welfare costs and volume-related increases, partially offset by lower expenses increased $584 million (30.2%) compared to 2016 primarily due to higher average fuel prices and increased volumes. D amortization expense increased $224 million (10.5%) compared to 2016 due to a larger base of depreciable assets in service. Equipm and other expense declined $219 million (11.8%) compared to 2016. These declines resulted from the impact of the enactment of the method investee, as well as lower personal injury and casualty costs.

Utilities and Energy ("Berkshire Hathaway Energy Company")

We currently own 90.9% of the outstanding common stock of Berkshire Hathaway Energy Company ("BHE"), which opera business. BHE's domestic regulated utility interests are comprised of PacifiCorp, MidAmerican Energy Company ("MEC") and N Britain, BHE subsidiaries operate two regulated electricity distribution businesses referred to as Northern Powergrid. BHE also ow regulated interstate natural gas pipeline companies. Other energy businesses include a regulated electricity transmission-only bus Canada ("AltaLink, L.P.") and a diversified portfolio of mostly renewable independent power projects. In addition, BHE also operate residential real estate brokerage firm and one of the largest residential real estate brokerage franchise networks in the Unit

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The rates our regulated businesses charge customers for energy and services are based, in large part, on the costs of busi including income taxes and a return on capital, and are subject to regulatory approval. To the extent these regulated operations are no such costs in the approved rates, operating results will be adversely affected. Among its provisions, the TCJA reduced the U.S. feder tax rate of our domestic regulated utilities from 35% to 21%. In 2018, BHE's regulated subsidiaries began passing the benefits of l expense attributable to the TCJA to customers through various regulatory mechanisms, including lower rates, higher depreciation an base, which produced lower revenue and pre-tax earnings in 2018. Revenues and earnings of BHE are summarized below (dolla

	Revenues			Earnings		
	2018	2017	2016	2018	2017	2016
PacifiCorp	$ 5,078	$ 5,276	$ 5,245	$ 745	$ 1,131	$ 1,105
MidAmerican Energy Company	3,117	2,906	2,668	407	372	392
NV Energy	3,065	3,048	2,925	417	567	559
Northern Powergrid	1,021	950	997	304	311	367
Natural gas pipelines	1,226	1,009	986	507	446	413
Other energy businesses	2,252	2,209	2,128	296	296	282
Real estate brokerage	4,228	3,456	2,815	204	220	225
Corporate interest	—	—	—	(408)	(844)	(465)
	$ 19,987	$ 18,854	$ 17,764			
Pre-tax earnings				2,472	2,499	2,878
Income tax expense (benefit)				(452)	148	371
Net earnings				2,924	2,351	2,507
Noncontrolling interests				303	318	277
Net earnings attributable to Berkshire Hathaway shareholders				$ 2,621	$ 2,033	$ 2,230
Effective income tax rate				(18.3)%	5.9%	12.9%

PacifiCorp

PacifiCorp operates a regulated electric utility in portions of several Western states, including Utah, Oregon and Wyoming. decreased 4% compared to 2017. Retail revenues in 2018 decreased $197 million compared to 2017. The decline reflected the effect rates ($180 million, including the impact of the TCJA of $152 million), and a reduction in volumes (0.2%), largely attributable to the

Pre-tax earnings decreased $386 million (34%) in 2018 as compared to 2017. Utility margin (operating revenues less cost o in 2018 was $3,269 million, a decrease of $198 million (6%) versus 2017. The decrease was primarily due to the declines in revenu the effects of the TCJA. In addition, pre-tax earnings were negatively impacted $174 million (offset in income tax expense) due to order that accelerated depreciation expense on certain thermal generation facilities. PacifiCorp's after-tax earnings in 2018 were decrease of $24 million (3%) from 2017.

Revenues increased 1% in 2017 compared to 2016. Wholesale and other revenues increased, reflecting higher volumes and retail revenues decreased slightly, attributable to lower average rates, partly offset by higher volumes. Pre-tax earnings increased $2 2017 as compared to 2016. The increase in earnings reflected higher utility margin, lower operations and maintenance expenses, depreciation and amortization attributable to additional plant in-service. PacifiCorp's after-tax earnings in 2017 were $763 millio $1 million from 2016.

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MidAmerican Energy Company

MEC operates a regulated electric and natural gas utility primarily in Iowa and Illinois. Revenues in 2018 increased $21 compared to 2017. Electric operating revenues increased $175 million (8%) and natural gas revenues increased $35 million (5%) in The increase in electric revenues was primarily attributable to higher retail revenues of $102 million, reflecting higher recoveries t (substantially offset in cost of sales, operating expenses and income tax expense) and volumes, partially offset by lower average rat from the impact of the TCJA, and higher wholesale and other revenues of $73 million from higher volumes and average prices. The gas revenues was primarily due to increased volumes, partially offset by a lower average per-unit price and the effects of th

Pre-tax earnings in 2018 increased $35 million (9%) compared to 2017. Electric utility margin in 2018 was $1,796 millio $122 million (7%) over 2017, which was primarily due to the net increase in retail revenues. However, the increase in electric utility offset by increased depreciation, maintenance and other operating expenses. The increase in depreciation expense included $65 milli wind generation and other plant placed in-service and $44 million from Iowa revenue sharing.

MEC's after-tax earnings in 2018 and 2017 were $669 million and $584 million, respectively, increases of $85 million (15% (10%), respectively, as compared to the corresponding prior years. MEC's after-tax earnings were significantly greater than pre-tax e due to production income tax credits received relating to wind-powered generating facilities.

Revenues increased $238 million (9%) in 2017 as compared to 2016. The increase was primarily attributable to higher el revenues ($123 million) and increased natural gas operating revenues ($82 million). Retail electric revenues increased $84 million in 2016, primarily attributable to higher recoveries through bill riders and from non-weather usage and growth and rate factors, partia unfavorable impact of milder temperatures in 2017. Wholesale electric and other revenues increased $39 million in 2017 versus 20 comparative increases in volumes, average rates and transmission fees. The natural gas operating revenues increase was primarily du per-unit costs of gas sold, which was offset by an increase in cost of sales. Pre-tax earnings declined $20 million (5%) in 2017 co reflecting increased depreciation, maintenance and other operating expenses and interest expense and debt extinguishment costs, p comparative increases in electric utility margins of $76 million.

NV Energy

NV Energy operates regulated electric and natural gas utilities in Nevada. Revenues in 2018 increased 1% compared to operating revenues increased $17 million in 2018, reflecting increased pass-through cost adjustments and higher volumes largely a impacts of weather and retail customer growth, partly offset by reductions from the impact of the TCJA and lower retail rates resul regulatory rate review. Natural gas operating revenue increased $5 million in 2018, primarily due to a higher average per-unit price, lower customer usage.

Pre-tax earnings in 2018 decreased $150 million (26%) compared to 2017. The decrease was primarily due to lower electric increased depreciation, maintenance and other operating costs. Electric utility margin in 2018 was $1,696 million, representing a $ decrease versus 2017. The decrease was primarily due to the effects of the TCJA, partially offset by the higher sales volumes. NV E earnings in 2018 were $317 million, a decline of 13% from 2017.

Revenues increased $123 million (4%) in 2017 compared to 2016. The increase was due primarily to an increase in retail revenues, which included a combination of increased rates from pass-through cost adjustments and higher volumes, partly offset by l energy efficiency programs (offset by lower operating expenses). NV Energy also experienced retail electric revenue declines from certain commercial and industrial customers electing to purchase power from alternative sources and thus becoming distribution serv Natural gas operating revenue declined $11 million in 2017, primarily due to lower rates, partially offset by higher customer usage. increased $8 million (1%) in 2017 compared to 2016, primarily due to lower interest expenses. NV Energy's after-tax earnings $365 million, an increase of 2% from 2016.

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Management’s Discussion and Analysis *(Continued)*

Utilities and Energy (“Berkshire Hathaway Energy Company”) *(Continued)*

Northern Powergrid

Revenues increased $71 million (7%) in 2018 compared to 2017, primarily due to the favorable foreign currency translation average U.S. Dollar in 2018 and increased smart meter and distribution revenues. Pre-tax earnings in 2018 decreased $7 million (2%) primarily due to higher depreciation and other operating expenses, including higher pension settlement losses, partly offset by fa currency translation effects and the increases in revenues.

Revenues declined $47 million (5%) in 2017 compared to 2016. Foreign currency translation effects of a comparatively s U.S. Dollar in 2017 resulted in a $48 million comparative decline in revenues. In addition, we experienced comparative declines revenues, which were substantially offset by higher smart metering revenue. Pre-tax earnings declined $56 million (15%) in 2017 c The decline was primarily due to foreign currency translation effects, as well as from increased pension expenses and lower distri partially offset by lower asset impairment charges and lower distribution costs.

Natural gas pipelines

Revenues increased $217 million (22%) in 2018 as compared to 2017, primarily due to higher transportation revenues of $ higher volumes and rates due to unique market opportunities and colder average temperatures and increased sales volumes ($99 m system balancing activities (substantially offset in cost of sales). Pre-tax earnings increased $61 million (14%) in 2018 compared to 2 to the increases in transportation revenues and lower depreciation expense, partly offset by comparative increases in operations a expenses.

Revenues increased $23 million (2%) in 2017 compared to 2016. Northern Natural Gas produced higher transportation reve sales, primarily from system balancing activities, which were partly offset by lower transportation revenues at Kern River. Pre-tax e $33 million (8%) in 2017 compared to 2016. The increase was primarily due to the increase in transportation revenues and a reducti regulatory liabilities related to the impact of an alternative rate structure approved by Kern River’s regulators in the first quarter of 2 by higher operating expenses.

Other energy businesses

Revenues in 2018 increased $43 million (2%) compared to 2017, reflecting a comparative increase from renewable energy. 2018 were unchanged from 2017 as the increased revenues from renewable energy were offset by increased depreciation expense operating expenses.

Revenues increased 4% in 2017 compared to 2016. AltaLink L.P.’s operating revenues increased $197 million (39%) in 2 2016, primarily due to effects of a decision in 2016 by its regulator, which changed the timing of when construction-in-progress exp in the rate base are billable to customers and earned in revenues. The decision resulted in a one-time net reduction in revenue in 201 reductions in expenses. In 2017, we also experienced a comparative revenue increase of 13% from renewable energy and a comparat from the unregulated retail services business. Pre-tax earnings in 2017 increased 5% compared to 2016, as increased earnings from and AltaLink L.P. were partly offset by lower earnings from the unregulated retail services business and other energy ve

Real estate brokerage

Revenues in 2018 increased 22% as compared to 2017, primarily due to recent business acquisitions. Pre-tax earnings decre 2018 compared to 2017, as higher operating costs and interest expense more than offset the revenue increase.

Revenues increased 23% in 2017 compared to 2016, primarily due to business acquisitions and an increase in average ho Pre-tax earnings decreased 2% in 2017 as compared to 2016. Earnings in 2017 included increased earnings from franchise businesses lower earnings from brokerage businesses, primarily due to higher operating expenses.

Corporate interest and income taxes

Corporate interest includes interest on unsecured debt issued by the BHE holding company and borrowings from Berks subsidiaries in connection with certain of BHE’s business acquisitions. The borrowings from Berkshire insurance subsidiaries were quarter of 2017. Corporate interest in 2017 also included pre-tax charges of $410 million from a tender offer completed in Decemb certain long-term debt of BHE. Otherwise, corporate interest declined 6% and 7%, respectively, in 2018 and 2017 as compared to t prior years, primarily due to lower average borrowings.

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Management's Discussion and Analysis *(Continued)*

Utilities and Energy ("Berkshire Hathaway Energy Company") *(Continued)*

Corporate interest and income taxes (Continued)

BHE's consolidated effective income tax rates were (18.3)% in 2018, 5.9% in 2017 and 12.9% in 2016. BHE's effective regularly reflect significant production tax credits from wind-powered electricity generation placed in service by our domestic regu other energy businesses. The decrease in the effective income tax rate in 2018 compared to 2017 was attributable to the reduction i corporate income tax rate, the impacts of rate making, adjustments to the amounts recorded for the repatriation tax on foreign ea production tax credits and lower U.S. income taxes on foreign earnings. The effective income tax rate in 2017 decreased versus 2016 increase in production tax credits.

Manufacturing, Service and Retailing

A summary of revenues and earnings of our manufacturing, service and retailing businesses follows (dollars in m

	Revenues			Earnings *		
	2018	2017	2016	2018	2017	2016
Manufacturing	$ 61,883	$ 57,645	$ 52,969	$ 9,366	$ 8,324	$ 7,735
Service and retailing	78,926	76,994	74,467	2,942	2,603	2,489
	$ 140,809	$ 134,639	$ 127,436			
Pre-tax earnings				12,308	10,927	10,224
Income taxes and noncontrolling interests				2,944	3,645	3,421
				$ 9,364	$ 7,282	$ 6,803
Effective income tax rate				23.4%	32.8%	33.0%

* *Excludes certain acquisition accounting expenses, which primarily related to the amortization of identified intangible assets reco with our business acquisitions. The after-tax acquisition accounting expenses excluded from earnings above were $932 million in in 2017 and $814 million in 2016. These expenses are included in "Other" in the summary of earnings on page K-32 and in the section on page K-53.*

Manufacturing

Our manufacturing group includes a variety of industrial, building and consumer products businesses. Industrial product specialty chemicals (The Lubrizol Corporation ("Lubrizol")), complex metal products for aerospace, power and general industrial Castparts Corp. ("PCC")), metal cutting tools/systems (IMC International Metalworking Companies ("IMC")), equipment and syste and agricultural industries (CTB International ("CTB")), and a variety of industrial products for diverse markets (Marmon, Sc LiquidPower Specialty Products ("LSPI")). Marmon includes UTLX Company ("UTLX"), which provides various products and s equipment leasing) for the rail and mobile crane industries.

The building products group includes homebuilding and manufactured housing finance (Clayton Homes), flooring (Shaw), and engineered products (Johns Manville), bricks and masonry products (Acme Building Brands), paint and coatings (Benjamin Mo and commercial construction and engineering products and systems (MiTek). The consumer products group includes leisure vehic several apparel and footwear operations (including Fruit of the Loom, Garan, H.H. Brown Shoe Group and Brooks Sports) and the ("Duracell"), a manufacturer of high performance alkaline batteries. This group also includes custom picture framing products (Lars products (Richline). A summary of revenues and pre-tax earnings of our manufacturing operations follows (dollars in mi

	Revenues			Pre-tax earnings		
	2018	2017	2016	2018	2017	2016
Industrial products	$ 30,679	$ 28,566	$ 26,935	$ 5,822	$ 5,065	$ 4,989
Building products	18,677	16,946	15,002	2,336	2,147	1,922
Consumer products	12,527	12,133	11,032	1,208	1,112	824
	$ 61,883	$ 57,645	$ 52,969	$ 9,366	$ 8,324	$ 7,735

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Industrial products

2018 versus 2017

Revenues from industrial products businesses were approximately $30.7 billion in 2018, an increase of approximately $2 compared to 2017. PCC's revenues in 2018 were $10.2 billion, an increase of 7.2% compared to 2017. The increase reflected incr aerospace markets in connection with new aircraft programs, partly offset by lower demand for industrial gas turbine products. PCC repurposing certain manufacturing assets previously used to support industrial gas turbine business to accommodate aerospace proc PCC experienced lower sales of certain pipe products in 2018, primarily attributable to the U.S tariffs.

Lubrizol's revenues in 2018 were $6.8 billion, an increase of 5.9% compared to 2017 due to higher average sales prices, fa product mix and foreign currency translation effects, and a 2% increase in aggregate unit volumes. Lubrizol experienced significant i material unit costs during 2018 and 2017, necessitating increases in sales prices. Lubrizol's consolidated volume included increases Materials (5%) and the Additives (1%) product lines.

Marmon's revenues in 2018 were $8.2 billion, an increase of 5.5% as compared to 2017. The revenue increase was primar volume increases in the Transportation Products sector, higher average metals prices in the Plumbing & Refrigeration, Electrical Pr Services sectors, and business acquisitions in the Transportation Products, Crane Services, and Engineered Wire & Cable sectors. Th partially offset by revenue decreases in the Beverage Technologies and Rail Products and Services sectors. Rail Products and Servic decreased due to lower railcar lease revenues, partly offset by increased railcar equipment sales and repair services. Throughout 2018 business experienced the negative effects of lower lease renewal rates for railcars versus the rates on expiring lease

IMC's revenues increased 16.1% in 2018 compared to 2017, due to a combination of factors, including higher unit sales, the acquisitions during 2017 and 2018, and foreign currency translation effects from a weaker average U.S. Dollar in the first half of 201 increased 4.0% in 2018 versus 2017, due to favorable foreign currency translation effects and modest sales growth in protein product systems.

Pre-tax earnings of the industrial products group were approximately $5.8 billion in 2018, an increase of $757 million (14 2017. Pre-tax earnings as a percentage of revenues were 19.0% in 2018 and 17.7% in 2017. The comparative earnings increase was p to certain one-time charges at PCC and Lubrizol in 2017.

PCC's pre-tax earnings increased 16.0% in 2018 compared to 2017. PCC's earnings in 2017 included certain one-time impairment charges of $272 million. Results in 2018 were negatively affected by costs associated with the temporary unplanned shu metals facilities, metal press outages and lower earnings from the industrial gas turbine business. The facilities that were shut-down production and were approximately 80% operational at the end of 2018. These facilities are expected to resume normal production addition, the aforementioned new aircraft programs involve relatively complex manufacturing processes and manufacturing costs t relatively high, negatively affecting earnings. However, we expect costs will decline as processes improve and efficiencies

Lubrizol's pre-tax earnings in 2018 increased 43.5% compared to earnings in 2017, which included pre-tax losses of a $190 million related to Lubrizol's disposition of an underperforming bolt-on business and related intangible asset impairments and re Before such charges, Lubrizol's earnings increased 17%, reflecting the previously mentioned increases in sales volumes and selling lower other restructuring charges, lower net interest expense, and the favorable effects of foreign currency translation and ongoing efforts, partly offset by higher raw material costs.

Marmon's pre-tax earnings in 2018 decreased 5.6% compared to 2017. The decrease was primarily due to lower pre-tax ear Products and Services sector ($126 million) and the Foodservice Technologies and Retail Solutions sectors ($33 million), partially c earnings from the Transportation Products sector and a non-recurring gain of $42 million in 2018 from the sale of certain assets c Technologies sector. The Rail Products and Services earnings decline was attributable to lower railcar leasing revenues and higher costs.

Industrial products (Continued)

IMC's pre-tax earnings increased significantly in 2018 compared to 2017, reflecting a combination of higher sales, increas efficiencies, the effects of business acquisitions and ongoing expense control efforts, partly offset by higher raw material costs. CTB in 2018 were lower, primarily due to lower gross sales margins attributable to raw material cost increases and higher other opera

2017 versus 2016

Industrial products revenues were approximately $28.6 billion in 2017, an increase of approximately $1.6 billion (6.1%) ver increased revenues at several of our businesses. PCC's revenues increased $754 million (8.6%) in 2017 compared to the eleven-mon period in 2016. On a comparable full year-to-date basis, PCC's revenues increased approximately 2.3% compared to 2

In 2017, PCC generated revenue increases from structural castings, airfoils and forged products and from business acquisitio lower revenues from airframe products and industrial gas turbine products used in power markets. Revenue increases associated wit into products for new aerospace programs were partly offset by revenue decreases from the winding down of prior programs. Lub increased $165 million (2.6%) compared to 2016, primarily due to higher unit volumes, partly offset by effects of the disposition of a business.

Marmon's revenues increased $305 million (4.1%) in 2017 versus 2016, primarily due to business acquisitions and higher a partly offset by lower overall volumes, changes in mix and lower leasing revenues from the Rail Products and Services sector. Railca declined due to fewer railcars on lease at lower rates. During 2017, railcars available for lease exceeded demand, which contributed rates.

IMC's revenues increased 13.3%, primarily due to increased customer demand and from business acquisitions. The global tools was generally higher in 2017. CTB's revenues increased 5.3% in 2017 compared to 2016. The increase reflected the impact of acquisition, partly offset by weak demand in the U.S. egg and poultry production markets and selling price pressures for grain st

Industrial products pre-tax earnings were approximately $5.1 billion in 2017, an increase of $76 million (1.5%) compared pre-tax earnings as a percentage of revenues were 17.7% in 2017 and 18.5% in 2016.

PCC's pre-tax earnings declined 12.5% in 2017 compared to the post-acquisition period in 2016, primarily due to certain c and impairment charges. Lubrizol's pre-tax earnings increased 17.3% in 2017 compared to 2016, due to the disposition in 2016 of a bolt-on business and ongoing cost containment efforts, partly offset by lower gross sales margins, which were primarily attributable raw material prices. In 2017, average raw material prices at Lubrizol, including base oil feedstock and petrochemicals, increased abo

Marmon's earnings in 2017 declined 3.5% compared to 2016, primarily due to lower earnings of the Rail Products and S partially offset by the effects of business acquisitions and ongoing cost control efforts.

Building products

2018 versus 2017

Revenues of the building products group in 2018 were approximately $18.7 billion, an increase of 10.2% compared to 201 of the building products group were approximately $2.3 billion in 2018, an increase of 8.8% versus 2017. Overall, pre-tax earnings revenues were 12.5% in 2018 and 12.7% in 2017. The pre-tax earnings increase was primarily due to higher earnings from Clayton partly offset by lower earnings from Johns Manville.

Clayton Homes' revenues were $6,046 million in 2018, an increase of $1,036 million (20.7%) over 2017. The increase w increase in revenues from home sales of $971 million (28.2%), primarily due to a 105% increase in unit sales of site built homes businesses acquired over the last two years. Unit sales of manufactured homes in 2018 also increased 4.9% compared to 2017. Aver site built homes are considerably higher than traditional manufactured homes. In addition, interest income from lending activities inc compared to 2017 primarily due to increased average outstanding loan balances.

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Building products (Continued)

Clayton Homes pre-tax earnings were $911 million in 2018, an increase of $145 million (19.0%) compared to 2017. The inc
2018 was primarily attributable to a significant increase in earnings from home building (manufactured housing and site built homes
reflected the impact of increased home sales and margins, as well as increased earnings from lending activities. A significant part o
earnings derives from manufactured housing lending activities. Pre-tax earnings from lending activities in 2018 declined 2% con
reflecting increased interest expense, attributable to higher average debt balances and interest rates and higher operating costs, whic
the increase in interest income. As of December 31, 2018 and 2017, aggregate loan balances outstanding were approximately $1
$13.7 billion, respectively.

Revenues of our other building products businesses increased 5.8% in 2018 to approximately $12.6 billion compared to 201
sales increased 7.9% and Johns Manville's sales increased 7.2% as compared to 2017. The increases reflected higher average selling
changes and overall unit volume increases.

Raw material and production costs of our building products businesses were generally higher in 2018. In particular, costs
dioxide and petrochemicals were substantially higher in 2018 than in 2017, as were product delivery costs, due in part to the shortage
the U.S. These cost increases precipitated sales price increases, although such increases have lagged the increases in raw materials co
increase in pre-tax earnings in 2018 of our other building products businesses ($43 million or 3.1%) lagged the 5.8% increase

2017 versus 2016

Building products revenues were approximately $16.9 billion in 2017, an increase of approximately $1.9 billion (13.0%) c
The increase was primarily attributable to bolt-on business acquisitions by Clayton, Shaw and MiTek. The remainder of the increa
volume increases at MiTek, Benjamin Moore and Johns Manville, partly offset by changes in prices and product mi

Clayton Homes' revenues were approximately $5.0 billion in 2017, an increase of $780 million (18%) compared to 2016.
primarily due to sales from newly-acquired site built home businesses, an increase in overall unit sales (9%) and higher average pric
from lending activities and other and financial services revenues increased 2% in 2017 compared to 2016.

Building products pre-tax earnings were $2.1 billion in 2017, an increase of $225 million (11.7%) compared to 2016. Pre-
percentage of revenues were 12.7% in 2017 and 12.8% in 2016. Clayton Homes' pre-tax earnings increased $21 million (2.8%) in 2
2016. Pre-tax earnings in 2017 from manufacturing, retailing and site built activities increased, while earnings from finance activitie
Clayton Homes' earnings in 2017 also included a gain from a legal settlement, offset by increased employee healthcare, technology, r
expenses. The comparative earnings increase reflected the effects of asset impairment, pension settlement and environmental cl
$107 million recorded in 2016 by Shaw and Benjamin Moore. The comparative earnings increase also was a result of bolt-on acquis
by comparative declines in average gross sales margin rates due to higher raw material and other production costs

Consumer products

2018 versus 2017

Consumer products revenues were approximately $12.5 billion in 2018, an increase of $394 million (3.2%) compared to
primarily due to revenue increases of Forest River and of our apparel and footwear businesses. Forest River's revenues increased
reflecting relatively unchanged unit sales versus 2017. However, over the second half of the year, comparative sales declined 5%,
decline in units sold. Management attributes the slowing of sales, in part, to the effects of U.S. tariffs on steel products. Apparel and
increased 4.6% to approximately $4.3 billion, primarily due to increased sales volume at Brooks Sports and Garan

Pre-tax earnings were $1,208 million in 2018, an increase of $96 million (8.6%) compared to 2017. Pre-tax earnings as
revenues were 9.6% in 2018 and 9.2% in 2017. The increase in earnings reflected increases from Duracell and the apparel and foo
partly offset by lower earnings from Forest River and Larson Juhl.

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Management's Discussion and Analysis *(Continued)*

Manufacturing, Service and Retailing *(Continued)*

Consumer products (Continued)

Forest River's pre-tax earnings in 2018 declined 9.0% compared to 2017. Operating results were adversely affected over t 2018, and in the fourth quarter in particular, by higher material costs, which, together with the effects of lower sales volumes, cont reduction in fourth quarter pre-tax earnings.

Pre-tax earnings of the apparel and footwear businesses increased 6.4% in 2018 compared to 2017, primarily attributable to in revenues and sales mix changes. Duracell's pre-tax earnings increased in 2018 compared to 2017, reflecting the favorable effe operational improvement efforts and a comparative decline in restructuring charges. Since its acquisition in 2016, Duracell has unde transition and restructuring initiatives intended to restore and maintain adequate profit levels over the long-term.

2017 versus 2016

Consumer products revenues were approximately $12.1 billion in 2017, an increase of $1.1 billion (10%) compared to 2 increases from Duracell and Forest River. Duracell's revenues increased 25.3% in 2017 compared to the ten-month post-acquisitio Forest River's revenues increased 13.7% in 2017 compared to 2016, reflecting a 13.5% comparative increase in units sold. Appar revenues were approximately $4.2 billion in 2017, an increase of 1.6% compared to 2016.

Consumer products pre-tax earnings increased $288 million (35%) in 2017 compared to 2016. The increase in earnings wa increased earnings from Duracell and Forest River. The improvement in Duracell's operating results in 2017 reflects an overall redu costs and the positive effects of ongoing restructuring and business development efforts. Forest River's earnings increased 23% in attributable to the increase in sales and lower manufacturing overhead rates. Earnings from apparel and footwear businesses increa compared to 2016, primarily due to increased earnings from the footwear businesses.

Service and retailing

A summary of revenues and pre-tax earnings of our service and retailing businesses follows (dollars in millio

	Revenues			Pre-tax earnings		
	2018	2017	2016	2018	2017	2016
Service	$ 13,333	$ 12,155	$ 11,300	$ 1,836	$ 1,519	$ 1,399
Retailing	15,606	15,064	15,092	860	785	659
McLane Company	49,987	49,775	48,075	246	299	431
	$ 78,926	$ 76,994	$ 74,467	$ 2,942	$ 2,603	$ 2,489

Service

Our service business group offers fractional ownership programs for general aviation aircraft (NetJets) and high technol operators of aircraft (FlightSafety). We also distribute electronic components (TTI) and franchise and service a network of quick se (Dairy Queen). Other service businesses include transportation equipment leasing (XTRA) and furniture leasing (CORT), electronic multimedia and regulatory filings (Business Wire), publication of newspapers and other publications (Buffalo News and the BH M operation of a television station in Miami, Florida (WPLG). We also offer third party logistics services that primarily serve the petro industries (Charter Brokerage).

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Service (Continued)

2018 versus 2017

Revenues of the service group were approximately $13.3 billion in 2018, an increase of approximately $1.2 billion (9.7%) TTI's revenues in 2018 increased approximately 33.7% compared to 2017, reflecting industry-wide increases in demand for electro many geographic markets around the world, and the effects of recent business acquisitions and favorable foreign currency translati TTI's revenue increase in 2018 was significant, revenue growth began to moderate in the fourth quarter, in part attributable to the in tariffs. WPLG generated a revenue increase of 20.8% in 2018 over 2017, primarily due to increased political advertising revenue. R Brokerage increased 53.3%, reflecting increased fees and product mix changes. Revenues of our leasing businesses increased 8.4% i 2017 due to increased over-the road trailer units on lease (XTRA) and increased furniture rental income (CORT).

Pre-tax earnings of the service group in 2018 were approximately $1.8 billion, an increase of $317 million (20.9%) comp comparative earnings increase was primarily due to TTI, which accounted for almost 84% of the increase. The earnings increase of due to the effects of the sales volume increases. In addition, XTRA, Charter Brokerage and NetJets each generated increased earning to 2017. The increases in earnings of these businesses were partly offset by lower earnings at FlightSafety, primarily due to reduced of flight simulators and impairment charges of $41 million related to certain fixed assets.

2017 versus 2016

Service business revenues were approximately $12.2 billion in 2017, an increase of $855 million (7.6%) compared to 2016 primarily attributable to TTI and NetJets. TTI's revenues increased 16.4% in 2017 compared to 2016, primarily due to higher custom revenues increased due to an increase in revenue flight hours and increased aircraft management services.

Pre-tax earnings were approximately $1.5 billion in 2017, an increase of $120 million (8.6%) compared to 2016. The comp earnings was primarily attributable to increased earnings of NetJets and TTI, partly offset by comparatively lower earnings from Fli our leasing, media and logistics businesses.

Retailing

Our retailers include Berkshire Hathaway Automotive ("BHA"). BHA includes over 80 auto dealerships that sell new a automobiles, and offer repair services and related products. BHA also operates two insurance businesses, two auto auctions and an maintenance products distributor. Our retailing businesses also include four home furnishings retailing businesses (Nebraska Furn Willey, Star Furniture and Jordan's), which sell furniture, appliances, flooring and electronics.

Other retailing businesses include three jewelry retailing businesses (Borsheims, Helzberg and Ben Bridge), See's Candi products), Pampered Chef (high quality kitchen tools), Oriental Trading Company (party supplies, school supplies and toys and nov Louis Motorrad ("Louis"), a Germany-based retailer of motorcycle accessories.

2018 versus 2017

Revenues of the retailing group were approximately $15.6 billion in 2018, an increase of $542 million (3.6%) compared revenues, which represented approximately 63% of the aggregate retailing revenues in each of the past three years, increased 4.0% i to 2017. The increase derived primarily from increased pre-owned vehicle sales and service contract revenues. Revenues from new relatively unchanged. Louis revenues increased 7.8% in 2018 versus 2017, primarily due to the translation effects of a weaker ave Home furnishings revenues increased 4.7% in 2018 over 2017, reflecting increased sales in certain geographic markets and the effe

Pre-tax earnings of the retailing group were $860 million in 2018, an increase of $75 million (9.6%) over 2017. The earnin higher earnings from BHA and Louis, partly offset by lower earnings from the home furnishings retailers. The earnings increase of from finance and service contract activities, partly offset by higher floorplan interest expense. The earnings increase at Louis refle increase and an increase in operating margin rate. Earnings of the home furnishings businesses declined 2.4% in 2018 compared to increased inventory liquidation, delivery and occupancy costs at Star Furniture.

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Retailing (Continued)

2017 versus 2016

Retailing revenues were $15.1 billion in 2017, slightly lower than in 2016. BHA's aggregate revenues declined 1.3% in 2 2016, due primarily due to a 3.7% decline in new and used cars sold, partly offset by higher service and finance revenues. Reven retailers increased 1.7% in 2017 compared to 2016.

Pre-tax earnings increased $126 million (19.1%) in 2017 as compared to 2016. The increase reflected comparatively high BHA, primarily due to increased earnings from service contract and finance activities and lower selling and administrative expense lower auto sales volumes and margins. Pre-tax earnings of our home furnishings retailers increased 6.5% in 2017 compared to 201 also produced comparatively higher earnings in 2017, primarily attributable to revenue increases and expense managemen

McLane Company

McLane operates a wholesale distribution business that provides grocery and non-food consumer products to retailers and (“grocery”) and to restaurants (“foodservice”). McLane also operates businesses that are wholesale distributors of distilled spirits (“beverage”). The grocery and foodservice businesses generate high sales and very low profit margins. These businesses have se customers, including Walmart, 7-Eleven, Yum! Brands and others. Grocery sales comprised approximately 67% of McLane's consoli with food service comprising most of the remainder. A curtailment of purchasing by any of its significant customers could have an periodic revenues and earnings.

McLane's revenues were approximately $50.0 billion in 2018, slightly higher than 2017, reflecting a slight increase in groce slight decrease in foodservice sales (1%). The decline in foodservice revenues was primarily due to a net loss of customers. Pre-ta $246 million in 2018, a decline of $53 million (17.7%), compared to 2017. McLane's grocery and foodservice businesses continue to competitive business environment, which is negatively affecting its current operating results. While gross margin rates increased sl increases in fuel, depreciation and certain other operating expenses more than offset the increase, producing a decline in pre-tax ear 2017. We expect the current unfavorable operating conditions will continue in 2019.

McLane's revenues were approximately $49.8 billion in 2017, an increase of 3.5% compared to 2016. The increase in reve due to a 4.7% increase in grocery business sales. Pre-tax earnings in 2017 were $299 million, a decrease of $132 million (30.6%) co earnings decline reflected a 57% decline in earnings from our grocery operations, partly offset by a $39 million increase in gains Throughout 2017, significant pricing pressures and an increasingly competitive business environment negatively affected McLane's particularly with respect to the grocery business.

Investment and Derivative Gains (Losses)

A summary of investment and derivative gains and losses follows (dollars in millions).

	2018	2017	2016
Investment gains (losses)	$ (22,155)	$ 1,410	$7,553
Derivative gains (losses)	(300)	718	751
Gains (losses) before income taxes and noncontrolling interests	(22,455)	2,128	8,304
Income taxes and noncontrolling interests	(4,718)	751	1,807
Net gains (losses)	$ (17,737)	$ 1,377	$6,497
Effective income tax rate	20.8%	34.9%	21.8%

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Management's Discussion and Analysis *(Continued)*

Investment and Derivative Gains (Losses) *(Continued)*

Investment gains (losses)

As discussed in Note 1(w) to the accompanying Consolidated Financial Statements, on January 1, 2018, we adopted a r pronouncement ("ASU 2016-01"), which requires the recognition of unrealized gains and losses arising from changes in market valu equity securities in the Consolidated Statements of Earnings. Prior to 2018, investment gains/losses related to equity securities were as the securities were sold, redeemed or exchanged based on the cost of the disposed securities. While ASU 2016-01 does not affec shareholders' equity or total comprehensive income, it has significantly increased the volatility of our periodic net earnings due to th equity securities portfolio and the inherent volatility of equity securities prices. Investment gains and losses from periodic changes i will continue to cause significant volatility in our consolidated earnings.

Pre-tax investment gains/losses reflected in earnings in 2018 included net unrealized losses of approximately $22.7 billion f equity securities still held at December 31, 2018, reflecting the declines in securities prices in the fourth quarter. Prior to the adoptio such unrealized gains and losses were included in other comprehensive income. Pre-tax net unrealized gains on equity securities r comprehensive income were approximately $29 billion in 2017 and $7 billion in 2016.

Pre-tax investment gains were approximately $1.4 billion in 2017 and $7.6 billion in 2016. Investment gains in 2016 includ the redemptions of our Wrigley and Kraft Heinz preferred stock investments and from the sales of Dow Chemical common stock tha the conversion of our Dow Chemical preferred stock investment. We also realized pre-tax gains of $1.1 billion in connection with th of our shares of P&G common stock for 100% of the common stock of Duracell. Income tax expense allocated to investment gains benefit from the reduction of certain deferred income tax liabilities in connection with the exchange of P&G common stock for Dura gain from this transaction was approximately $1.9 billion.

We believe that investment gains/losses, whether realized from sales or unrealized from changes in market prices, are ofte terms of understanding our reported consolidated earnings or evaluating our periodic economic performance. We continue to belie investment gains/losses included in earnings, including the changes in market prices for equity securities, in any given period has l predictive value.

Derivative gains (losses)

Derivative contract gains/losses include the changes in fair value of our equity index put option contract liabilities. These contracts entered into before March 2008. Substantially all of these contracts will expire between April 2019 and February 2023. Th in the fair values of these liabilities are recorded in earnings and can be significant, reflecting the volatility of underlying equity mark in the inputs used to measure such liabilities.

As of December 31, 2018, the intrinsic value of our equity index put option contracts was approximately $1,653 million liabilities at fair value were approximately $2,452 million. Our ultimate payment obligations, if any, under our contracts will be de contract expiration dates based on the intrinsic value as defined under the contracts. Contracts with an aggregate notional value o $12.2 billion will expire in 2019.

Derivative contracts produced pre-tax losses in 2018 of $300 million, which were primarily due to lower index values. Equi contracts produced pre-tax gains of $718 million in 2017 and $662 million in 2016, which reflected the effects of shorter remaining and overall higher index values. In July 2016, our last credit default contract was terminated by mutual agreement with the counterpa counterparty $195 million. This contract produced pre-tax earnings of $89 million in 2016.

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Other

A summary of after-tax other earnings (losses) follows (in millions).

	2018	2017	2016
Equity method earnings (losses)	$ (1,419)	$ 1,111	$ 707
Acquisition accounting expenses	(1,111)	(936)	(846)
Corporate interest expense, before foreign currency effects	(311)	(266)	(256)
Euro note foreign exchange gains (losses)	289	(655)	159
Corporate interest and dividend income	530	232	288
Other	456	29	(83)
Net earnings (losses) attributable to Berkshire Hathaway shareholders	$ (1,566)	$ (485)	$ (31)

After-tax equity method earnings includes Berkshire's share of earnings attributable to Kraft Heinz, Pilot Flying J, Berka Transmission of Texas. Our after-tax equity method losses in 2018 included approximately $2.7 billion from intangible asset imp recorded by Kraft Heinz. Our after-tax equity method earnings in 2017 excluded approximately $1.1 billion from the net effects of t Heinz's net earnings. Corporate interest and dividend income in 2016 included pre-tax dividend income of $180 million from our Kr stock investment, which Kraft Heinz redeemed in June 2016.

After-tax other earnings (losses) also include charges arising from the application of the acquisition method in connectio Berkshire's past business acquisitions. Such charges were primarily from the amortization or impairment of intangible assets recor with those business acquisitions.

Berkshire issued Euro denominated debt in 2015, 2016 and 2017 and the aggregate par amount outstanding was €6.85 billi 2018. Changes in foreign currency exchange rates produced sizable non-cash unrealized gains and losses in each of the past three periodic revaluation of these liabilities into U.S. Dollars.

Financial Condition

Our consolidated balance sheet continues to reflect significant liquidity and a strong capital base. Consolidated shareho December 31, 2018 was approximately $349 billion, a decrease of $26.9 billion since September 30, 2018 and an increase of $40 December 31, 2017. Net earnings attributable to Berkshire shareholders in 2018 were $4.0 billion, which included after-tax losses on approximately $17.5 billion. After-tax losses on investments were approximately $27.6 billion in the fourth quarter of 2018, reflecti market prices of the equity securities we owned at December 31, 2018.

At December 31, 2018, our insurance and other businesses held cash, cash equivalents and U.S. Treasury Bills of approxim which included $85 billion in U.S. Treasury Bills. Investments in equity and fixed maturity securities (excluding our investment in approximately $193 billion.

Berkshire parent company debt outstanding at December 31, 2018 was approximately $16.9 billion, a decrease of $1.9 December 31, 2017, reflecting term debt maturities of $1.55 billion and a $366 million decrease attributable to foreign currency exc applicable to the €6.85 billion par amount of Euro denominated senior notes. Berkshire parent company debt of $750 million ma

Borrowings of Berkshire's insurance and other subsidiaries declined $3.5 billion in 2018 to approximately $18.1 billion at D primarily attributable to a net decrease in borrowings of Berkshire Hathaway Finance Corporation ("BHFC"), a wholly-owned fina During 2018, BHFC repaid $4.6 billion of maturing senior notes and issued $2.35 billion of 4.2% senior notes due in 2048. BHF borrowings are used to fund loans originated and acquired by Clayton Homes and a portion of assets held for lease by our UTLX business. In January 2019, BHFC repaid $950 million of maturing senior notes and issued $1.25 billion of 4.25% senior notes d additional $3.0 billion of BHFC senior notes will mature in 2019. Berkshire guarantees the full and timely payment of principal and i to BHFC's senior notes.

Our railroad, utilities and energy businesses (conducted by BNSF and BHE) maintain very large investments in capital ass and equipment) and will regularly make significant capital expenditures in the normal course of business. We forecast capital expend operations will approximate $10.5 billion for the year ending December 31, 2019.

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BNSF's outstanding debt approximated $23.2 billion as of December 31, 2018, an increase of $727 million since December
BNSF issued $1.5 billion of senior unsecured debentures due in 2048 with a weighted average interest rate of 4.1%. BNSF debentur
will mature in 2019.

Outstanding borrowings of BHE and its subsidiaries were approximately $39.3 billion at December 31, 2018, a decrease of
December 31, 2017. In 2018, BHE issued $3.2 billion of senior unsecured debt with maturities ranging from 2021 to 2049 with a w
interest rate of 3.6%. BHE subsidiaries also issued debt in 2018, aggregating $2.3 billion with maturity dates ranging from 2020 to 2
from these financings were used to repay borrowings, to fund capital expenditures and for other general corporate purposes. Approxi
of BHE subsidiary term debt will mature in 2019. Berkshire does not guarantee the repayment of debt issued by BNSF, BHE or any o
and is not committed to provide capital to support BNSF, BHE or any of their subsidiaries.

Berkshire's common stock repurchase program was amended on July 17, 2018, permitting Berkshire to repurchase its Cla
shares at prices below Berkshire's intrinsic value, as conservatively determined by Warren Buffett, Berkshire's Chairman of the B
Executive Officer, and Charlie Munger, Vice Chairman of the Board. The program allows share repurchases in the open market or
negotiated transactions and does not specify a maximum number of shares to be repurchased. The program is expected to continue in
not repurchase our stock if it reduces the total amount of Berkshire's consolidated cash, cash equivalents and U.S. Treasury Bills
$20 billion. Financial strength and redundant liquidity will always be of paramount importance at Berkshire. Subsequent to the progr
2018, Berkshire repurchased shares of Class A and B common stock for an aggregate cost of approximately $1.3 billi

Contractual Obligations

We are party to contracts associated with ongoing business and financing activities, which will result in cash payments to
future periods. Certain obligations are included in our Consolidated Balance Sheets, such as notes payable, which require future
contractually specified dates and in fixed and determinable amounts. Other obligations pertaining to the acquisition of goods or serv
such as minimum rentals under operating leases and certain purchase obligations not currently reflected in the financial statements, w
future periods as the goods are delivered or services are provided. Beginning in 2019, operating lease obligations will be included in
balance sheet upon the adoption of a new accounting pronouncement. The timing and amount of the payments under certain contracts
and reinsurance contracts, are contingent upon the outcome of future events. Actual payments will likely vary, perhaps materially, f
liabilities currently recorded in our Consolidated Balance Sheet.

A summary of our contractual obligations as of December 31, 2018 follows (in millions). Actual payments will likely
significantly, from estimates reflected in the table.

	Estimated payments due by period				
	Total	**2019**	**2020-2021**	**2022-2023**	**After 2023**
Notes payable and other borrowings, including interest	$ 153,059	$ 15,840	$ 17,777	$ 20,341	$ 99,101
Operating leases	9,013	1,360	2,415	1,580	3,658
Purchase obligations *(1)*	47,264	15,709	8,181	6,078	17,296
Unpaid losses and loss adjustment expenses *(2)*	110,292	22,204	25,329	14,613	48,146
Life, annuity and health insurance benefits *(3)*	34,362	1,461	(82)	322	32,661
Other	15,589	628	1,748	4,876	8,337
Total	$ 369,579	$ 57,202	$ 55,368	$ 47,810	$ 209,199

(1) *Primarily related to fuel, capacity, transmission and maintenance contracts and capital expenditure commitments of BHE and B purchase commitments of NetJets.*

(2) Includes unpaid losses and loss adjustment expenses under retroactive reinsurance contracts.

(3) *Amounts represent estimated undiscounted benefits, net of estimated future premiums, as applicable.*

Management's Discussion and Analysis *(Continued)*

Critical Accounting Policies

Certain accounting policies require us to make estimates and judgments in determining the amounts reflected in the Conso Statements. Such estimates and judgments necessarily involve varying, and possibly significant, degrees of uncertainty. Accordingly currently recorded in the financial statements will likely be adjusted in the future based on new available information and changes circumstances. A discussion of our principal accounting policies that required the application of significant judgments as of Decembe

Property and casualty losses

We record liabilities for unpaid losses and loss adjustment expenses (also referred to as "gross unpaid losses" or "claim liab estimates of the ultimate amounts payable for losses occurring on or before the balance sheet date. The timing and amount of ultimat contingent upon, among other things, the timing of claim reporting from insureds and ceding companies and the final determination through the loss adjustment process. We use a variety of techniques in establishing claim liabilities and all techniques require signific assumptions.

As of the balance sheet date, recorded claim liabilities include provisions for reported claims, as well as claims not yet r development of reported claims. The period between the loss occurrence date and loss settlement date is the "claim-tail." Property c relatively short claim-tails, absent litigation. Casualty claims usually have longer claim-tails, occasionally extending for decades. Ca be more susceptible to litigation and the impact of changing contract interpretations. The legal environment and judicial process fu extending claim-tails.

Our consolidated claim liabilities as of December 31, 2018 were approximately $110 billion, of which 84% related to G Berkshire Hathaway Reinsurance Group. Additional information regarding significant uncertainties inherent in the processes and te businesses follows.

GEICO

GEICO predominantly writes private passenger auto insurance. As of December 31, 2018, GEICO's gross unpaid losses w Claim liabilities, net of reinsurance recoverable were $18.6 billion.

GEICO's claim reserving methodologies produce liability estimates based upon the individual claims. The key assumptio liability estimates include projections of ultimate claim counts ("frequency") and average loss per claim ("severity"). We utilize a co actuarial estimation methods, including Bornhuetter-Ferguson and chain-ladder methodologies.

Claim liability estimates for automobile liability coverages (such as bodily injury ("BI"), uninsured motorists, and personal are more uncertain due to the longer claim-tails, so we establish additional case development estimates. As of December 31, 2018, liabilities averaged approximately 30% of the case reserves. We select case development factors through analysis of the overall ade case liabilities.

For incurred-but-not-reported ("IBNR") claims, liabilities are based on projections of the ultimate number of claims expe unreported) for each significant coverage. We use historical claim count data to develop age-to-age projections of the ultimate cou accident period, from which we deduct reported claims to produce the number of unreported claims. We estimate the average costs p and apply such estimates to the unreported claim counts, producing an IBNR liability estimate. We may record additional IBNR actuarial techniques are difficult to apply.

We test the adequacy of the aggregate claim liabilities using one or more actuarial projections based on claim closure mo incurred loss triangles. Each type of projection analyzes loss occurrence data for claims occurring in a given period and projects t

Our claim liability estimates recorded at the end of 2017 decreased $222 million during 2018, which produced a correspo pre-tax earnings. We modified the assumptions used to estimate liabilities at December 31, 2018 to reflect the most recent frequency Future development of recorded liabilities will depend on whether actual frequency and severity are more or less than anti

With respect to liabilities for BI claims, our most significant claim category, we believe it is reasonably possible that avera change by at least one percentage point from the severities used in establishing the recorded liabilities at December 31, 2018. We e percentage point increase or decrease in BI severities would produce a $275 million increase or decrease in recorded liabilities, wit decrease or increase in pre-tax earnings. Many of the economic forces that would likely cause BI severity to differ from expectation cause severities for other injury coverages to differ in the same direction.

Management's Discussion and Analysis *(Continued)*

Property and casualty losses *(Continued)*

Berkshire Hathaway Reinsurance Group ("BHRG")

BHRG's liabilities for unpaid losses and loss adjustment expenses derive primarily from reinsurance contracts issued thr General Re. In connection with reinsurance contracts, the nature, extent, timing and perceived reliability of premium and loss inform ceding companies varies widely depending on the type of coverage and the contractual reporting terms. Contract terms, conditions a tend to lack standardization and may evolve more rapidly than primary insurance policies.

The nature and extent of loss information provided under many facultative (individual risk), per occurrence excess or retro contracts may not differ significantly from the information received under a primary insurance contract if reinsurer personnel either the ceding company in settling individual claims or manage the claims themselves. However, loss information is often less detaile aggregate excess-of-loss and quota-share contracts. Additionally, loss information we receive through periodic reports is often in a rather than on an individual claim basis. Loss data includes recoverable paid losses, as well as case loss estimates. Ceding compar provide reliable IBNR estimates to reinsurers.

Loss reporting to reinsurers is typically slower in comparison to primary insurers. Periodic premium and claims reports a ceding companies. In the U.S., such reports are generally required at quarterly intervals ranging from 30 to 90 days after the end of tl Outside of the U.S., reinsurance reporting practices may vary further. In certain countries, clients report annually, often 90 to 180 da the annual period. In some instances, reinsurers assume and cede underlying risks thereby creating multiple contractual parties bet primary insured, potentially compounding the claim reporting delays. The relative impact of reporting delays on the reinsurer may v the type of coverage, contractual reporting terms, the magnitude of the claim relative to the attachment point of the reinsurance cove reasons.

As reinsurers, the premium and loss data we receive is at least one level removed from the underlying claimant, so there is data reported is incomplete, inaccurate or the claim is outside the coverage terms. When received, we review the information for c compliance with the contract terms. Generally, our reinsurance contracts permit us to access the ceding company's books and records subject business, thus providing the ability to audit the reported information. In the normal course of business, disputes occasionally whether claims are covered by our reinsurance policies. We resolve most coverage disputes through negotiation with the client. If d resolved, our contracts generally provide arbitration or alternative dispute resolution processes. There are no coverage disputes at thi adverse resolution would likely have a material impact on our consolidated results of operations or financial conditi

A summary of BHRG's property and casualty unpaid losses and loss adjustment expenses, other than retroactive reinsuran adjustment expenses, as of December 31, 2018 follows (in millions).

	General Re			NICO			Tot	
	Property	Casualty	Total	Property	Casualty	Total	Property	Casua
Reported case liabilities	$ 1,682	$ 6,310	$ 7,992	$ 3,903	$ 3,194	$ 7,097	$ 5,585	$ 9,5
IBNR liabilities	1,657	7,126	8,783	2,550	4,440	6,990	4,207	11,5
Gross unpaid losses and loss adjustment expenses	3,339	13,436	16,775	6,453	7,634	14,087	9,792	21,0
Reinsurance recoverable	285	668	953	27	182	209	312	85
Net unpaid losses and loss adjustment expenses	$ 3,054	$ 12,768	$ 15,822	$ 6,426	$ 7,452	$ 13,878	$ 9,480	$ 20,2

Gross unpaid losses and loss adjustment expenses in the table above consist primarily of traditional property and casualty primarily under excess-of-loss and quota-share treaties. Under certain contracts, coverage can apply to multiple lines of business wri company may not report loss data by such lines consistently, if at all. In those instances, we allocated losses to property and casualty internal estimates.

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Management's Discussion and Analysis *(Continued)*

Property and casualty losses *(Continued)*

Berkshire Hathaway Reinsurance Group ("BHRG") (Continued)

With respect to General Re, we use a variety of actuarial methodologies to establish unpaid losses and loss adjustment ex methodologies, such as paid and incurred loss development techniques, incurred and paid loss Bornhuetter-Ferguson techniques ar severity techniques, are utilized, as well as ground-up techniques when appropriate. The critical processes involved in estimating unp adjustment expenses include the establishment of case liability estimates, the determination of expected loss ratios and loss reportin drive IBNR liability estimates, and the comparison of reported activity to the expected loss reporting patterns.

General Re's process for estimating unpaid losses and loss adjustment expenses starts with case loss estimates reported by We independently evaluate certain reported case losses and if appropriate, we use our own case liability estimate. As of December 3 loss estimates exceeded ceding company estimates by approximately $2.0 billion, which were concentrated in legacy workers' com occurring over 10 years ago. We also periodically conduct detailed reviews of individual client claims, which may cause us to adjust

In estimating IBNR liabilities, General Re considers expected case loss emergence and development patterns, together with by year. In this process, we classify all loss and premium data into groups or portfolios of policies based primarily on product ty facultative and program), line of business (e.g., auto liability, property and workers' compensation) and/or geographic jurisdiction, a contractual features or market segment. For each portfolio, we aggregate premiums and losses by accident year or coverage period an and incurred loss data over time. We estimate the expected development of reported claims, which, together with the expected loss calculate IBNR liability estimates. Factors affecting our loss development analysis include, but are not limited to, changes in the follo reporting and settlement practices; the frequency of client company claim reviews; policy terms and coverage (such as loss reten occurrence and aggregate policy limits); loss trends; and legal trends that result in unanticipated losses. Collectively, these factor selections of expected case loss emergence patterns.

NICO generally establishes reinsurance claim liabilities on a contract-by-contract basis determined from case loss estimates companies and IBNR liabilities that are primarily a function of an anticipated loss ratio for the contract and the reported case loss es are adjusted upward or downward over time to reflect case losses reported versus expected case losses, which we use to form revised adequacy of the expected loss ratio and the level of IBNR liabilities required for unreported claims. Anticipated loss ratios are also estimates of known major catastrophe events.

Certain catastrophe, individual risk and aviation excess-of-loss contracts tend to generate low frequency/high severity loss and techniques for estimating liabilities under such contracts generally rely more on a per-policy assessment of the ultimate cost as individual loss event rather than with an analysis of the historical development patterns of past losses.

BHRG's estimated ultimate net losses for prior years' loss events were reduced $469 million in 2018, which produced a cor in pre-tax earnings. Reported claims for prior years' property loss events were less than anticipated and we reduced our estimated ult $365 million. Property losses incurred during any given period may be more volatile because of the effect of catastrophe and large i loss events. In addition, we lowered estimated ultimate losses for prior years' casualty events $104 million in 2018, reflecting redu workers' compensation and other casualty coverages, partially offset by an increase in estimates for asbestos, environmental and o claims.

General Re's reported losses for prior years' workers' compensation claims were less than expected. After reevaluating ex IBNR estimates, liabilities were reduced by $117 million. An increase of ten percent in the tail of the expected loss emergence pattern ten percent in the expected loss ratios would produce a net increase of approximately $1 billion in General Re's workers' compensati producing a corresponding decrease in pre-tax earnings. We believe it is reasonably possible for these assumptions to increase a

We reduced estimated ultimate losses for prior years' events for other casualty losses, excluding asbestos, environmental, injury claims, by $132 million in 2018, reflecting lower than expected reported losses. For General Re's significant casualty and portfolios, we estimate that an increase of five percent in the claim-tails of the expected loss emergence patterns and a five percent in loss ratios would produce a net increase in our nominal IBNR liabilities and a corresponding reduction in pre-tax earnings of a $800 million. While we believe it is reasonably possible for these assumptions to increase at these rates, more likely outcomes are les given the diversification in worldwide business.

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Estimated ultimate liabilities for asbestos, environmental and other latent injury claims were increased approximately $14 which produced a corresponding reduction in pre-tax earnings. Net liabilities for such claims, excluding amounts assumed under retr contracts, were approximately $1.7 billion at December 31, 2018. We may use industry-wide loss experience data and informed judg loss data is of limited reliability in making estimates for such losses. Loss estimations for these exposures are difficult to determine c legal environment, and increases may be required in the future if new exposures or claimants are identified, new claims are reported liability emerge. In addition to the previously described methodologies, we consider "survival ratios," which is the average net claim years in relation to net unpaid losses, as a rough guide to reserve adequacy. Our survival ratio was approximately 16 years as of De

Retroactive reinsurance

Our retroactive reinsurance contracts cover loss events occurring before the contract inception dates. Claim liabilities relatin reinsurance contracts are predominately related to casualty or liability exposures. We expect the claim-tails to be very long. Our gro deferred charge assets, and net liabilities at December 31, 2018 were as follows (in millions).

	Gross unpaid losses	Deferred charges	Liabilities, net of deferred charges
December 31, 2018	$ 41,834	$ 14,104	$ 27,730

Our contracts are generally subject to maximum limits of indemnifications. We currently expect that maximum remaining g under our retroactive policies will not exceed $55 billion due to the applicable aggregate contract limits. Absent significant judici changes affecting asbestos, environmental or latent injury exposures, we also currently believe it unlikely that losses will develop maximum losses payable or downward by more than 15% of our $41.8 billion estimated liability at December 31, 20

We establish liability estimates by individual contract, considering exposure and development trends. In establishing our lia often analyze historical aggregate loss payment patterns and project expected ultimate losses under various scenarios. We assign judg factors to these scenarios and an expected outcome is determined. We then monitor subsequent loss payment activity and review c reports and other available information concerning the underlying losses. We re-estimate the expected ultimate losses when signi significant deviations from expected results are revealed.

Certain of our retroactive reinsurance contracts include asbestos, environmental and other latent injury claims. Our estimated claims were approximately $13.1 billion at December 31, 2018. We do not consistently receive reliable detailed data regarding asbes and latent injury claims from all ceding companies, particularly with respect to multi-line or aggregate excess-of-loss policies. Wh conduct a detailed analysis of the underlying loss data to make an estimate of ultimate reinsured losses. When detailed loss informat we develop estimates by applying recent industry trends and projections to aggregate client data. Judgments in these areas necessa stability of the legal and regulatory environment under which we expect these claims will be adjudicated. Legal reform and legislatio significant impact on our ultimate liabilities.

We reduced estimated ultimate liabilities for prior years' retroactive reinsurance contracts by $341 million in 2018, which a related deferred charge assets, resulted in pre-tax earnings of $185 million. In 2018, we paid losses and loss adjustment expenses c $1.4 billion with respect to these contracts.

In connection with our retroactive reinsurance contracts, we also record deferred charge assets, which at contract inceptio excess, if any, of the estimated ultimate liability for unpaid losses over premiums. We amortize deferred charge assets, which proc pre-tax earnings in future periods based on the expected timing and amount of loss payments. We also adjust deferred charge balance the expected timing and ultimate amount of claim payments. Significant changes in such estimates may have a significant effect c deferred charge balances and the amount of periodic amortization. Based on the contracts in effect as of December 31, 2018, we curr amortization expense in 2019 will approximate $1.2 billion.

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Other Critical Accounting Policies

Our Consolidated Balance Sheet at December 31, 2018 included goodwill of acquired businesses of $81.0 billion. We eval impairment at least annually and we conducted our most recent annual review during the fourth quarter of 2018. Our review include estimated fair values of our reporting units. There are several methods of estimating a reporting unit's fair value, including mark underlying asset and liability fair value determinations and other valuation techniques, such as discounted projected future net earnin and multiples of earnings. We primarily use discounted projected future earnings or cash flow methods. The key assumptions and in methods may include forecasting revenues and expenses, operating cash flows and capital expenditures, as well as an appropriate dis inputs. A significant amount of judgment is required in estimating the fair value of a reporting unit and in performing goodwill impai the inherent uncertainty in forecasting cash flows and earnings, actual results may vary significantly from the forecasts. If the carr reporting unit, including goodwill, exceeds the estimated fair value, then, as required by GAAP, we estimate the fair values of the ide liabilities of the reporting unit. The excess of the estimated fair value of the reporting unit over the estimated fair value of its net ass implied value of goodwill. The excess of the recorded amount of goodwill over the implied goodwill value is charged to earnings as a

Market Risk Disclosures

Our Consolidated Balance Sheets include substantial amounts of assets and liabilities whose fair values are subject to m significant market risks are primarily associated with equity prices, interest rates, foreign currency exchange rates and commodity pri of our investment portfolios and equity index put option contracts remain subject to considerable volatility. The following sectio significant market risks associated with our business activities.

Equity Price Risk

Equity securities represent a significant portion of our investment portfolio. Strategically, we strive to invest in business excellent economics and able and honest management, and we prefer to invest a meaningful amount in each investee. Consequently, are concentrated in relatively few issuers. At December 31, 2018, approximately 68% of the total fair value of equity securities was c issuers.

We often hold our equity investments for long periods and short-term price volatility has occurred in the past and will occu also strive to maintain significant levels of shareholder capital and ample liquidity to provide a margin of safety against short-term

We are also subject to equity price risk with respect to our equity index put option contracts. While our ultimate liability w contracts is determined from the movement of the underlying stock index between the contract inception date and expiration date, f contracts are also affected by changes in other factors such as interest rates, expected dividend rates and the remaining duration c

The following table summarizes our equity securities and derivative contract liabilities with significant equity price risk as 2018 and 2017 and the estimated effects of a hypothetical 30% increase and a 30% decrease in market prices as of those dates. Th hypothetical increase and decrease does not reflect the best or worst case scenario. Indeed, results from declines could be far wors nature of equity markets and the aforementioned concentrations existing in our equity investment portfolio. Dollar amounts ar

	Fair Value	Hypothetical Price Change	Estimated Fair Value after Hypothetical Change in Prices	Hypothetical Percentage Increase (Decrease) in Shareholders' Equity [(1)]
December 31, 2018				
Investments in equity securities	$ 172,757	30% increase	$ 224,584	11.7%
		30% decrease	120,930	(11.7)
Equity index put option contract liabilities	2,452	30% increase	1,131	0.3
		30% decrease	5,362	(0.7)
December 31, 2017				
Investments in equity securities	$ 170,540	30% increase	$ 221,702	11.6%
		30% decrease	119,378	(11.6)
Equity index put option contract liabilities	2,172	30% increase	1,036	0.3
		30% decrease	4,804	(0.6)

(1) *The hypothetical percentage increase (decrease) is after income taxes at the statutory rate in effect as of the balance sheet date.*

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Management's Discussion and Analysis *(Continued)*

Interest Rate Risk

We may also invest in bonds, loans or other interest rate sensitive instruments. Our strategy is to acquire or originate such in considered appropriate relative to the perceived credit risk. We also issue debt in the ordinary course of business to fund business op acquisitions and for other general purposes. We attempt to maintain high credit ratings, in order to minimize the cost of our debt. We derivative products, such as interest rate swaps, to manage interest rate risks.

The fair values of our fixed maturity investments, loans and finance receivables, and notes payable and other borrowings response to changes in market interest rates. In addition, changes in interest rate assumptions used in our equity index put option con changes in reported liabilities with respect to those contracts. Increases and decreases in interest rates generally translate into decreas fair values of these instruments. Additionally, fair values of interest rate sensitive instruments may be affected by the creditworthin prepayment options, relative values of alternative investments, the liquidity of the instrument and other general market co

The following table summarizes the estimated effects of hypothetical changes in interest rates on our significant assets and subject to significant interest rate risk at December 31, 2018 and 2017. We assumed that the interest rate changes occur immediately each category of instrument and that there were no significant changes to other factors used to determine the value of the instrument changes in interest rates do not reflect the best or worst case scenarios. Actual results may differ from those reflected in the table. Dol

		Estimated Fair Value after Hypothetical Change in Interest Rates (bp=basis points)			
	Fair Value	**100 bp decrease**	**100 bp increase**	**200 bp increase**	**300 bp increase**
December 31, 2018					
Assets:					
Investments in fixed maturity securities	$ 19,898	$ 20,260	$ 19,549	$ 19,214	$ 18,891
Loans and finance receivables	16,377	17,006	15,844	15,318	14,823
Liabilities:					
Notes payable and other borrowings:					
Insurance and other	35,361	37,559	33,380	31,691	30,208
Railroad, utilities and energy	66,422	73,063	60,840	56,107	52,063
Equity index put option contracts	2,452	2,669	2,249	2,057	1,877
December 31, 2017					
Assets:					
Investments in fixed maturity securities	$ 21,353	$ 22,053	$ 20,742	$ 20,200	$ 19,717
Loans and finance receivables	14,136	14,655	13,652	13,199	12,774
Liabilities:					
Notes payable and other borrowings:					
Insurance and other	41,762	43,937	39,844	38,140	36,619
Railroad, utilities and energy	70,538	77,091	64,582	59,730	55,581
Equity index put option contracts	2,172	2,460	1,911	1,676	1,465

Management's Discussion and Analysis *(Continued)*

Foreign Currency Risk

Certain of our subsidiaries operate in foreign jurisdictions and we transact business in foreign currencies. In addition, we h common stocks of major multinational companies, such as The Coca-Cola Company, who have significant foreign business and forei their own. We generally do not attempt to match assets and liabilities by currency and do not use derivative contracts to hedge or currency price changes in any meaningful way.

Our net assets subject to financial statement translation into U.S. Dollars are primarily in our insurance, utilities and ene manufacturing and services subsidiaries. This translation related impact may be offset by gains or losses included in net earnings rela of Berkshire and certain of its U.S. subsidiaries that are denominated in foreign currencies, due to changes in exchange rates. A sumr (losses), after-tax, for each of the years ending December 31, 2018 and 2017 follows (in millions).

	2018	2017
Euro-denominated debt included in net earnings	$ 289	$ (655)
Net liabilities under certain reinsurance contracts included in net earnings	207	(295)
Foreign currency translation included in other comprehensive income	(1,424)	2,151

Commodity Price Risk

Our subsidiaries use commodities in various ways in manufacturing and providing services. As such, we are subject to pri various commodities. In most instances, we attempt to manage these risks through the pricing of our products and services to custor that we are unable to sustain price increases in response to commodity price increases, our operating results will likely be adversely utilize derivative contracts to manage a portion of commodity price risks at BHE.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

See "Market Risk Disclosures" contained in Item 7 "Management's Discussion and Analysis of Financial Condition a Operations."

Management's Report on Internal Control Over Financial Reporting

Management of Berkshire Hathaway Inc. is responsible for establishing and maintaining adequate internal control over fina such term is defined in the Securities Exchange Act of 1934 Rule 13a-15(f). Under the supervision and with the participation of o including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of the Co control over financial reporting as of December 31, 2018 as required by the Securities Exchange Act of 1934 Rule 13a-15(c). In mak we used the criteria set forth in the framework in *Internal Control—Integrated Framework* (2013) issued by the Committee of Spons of the Treadway Commission. Based on our evaluation under the framework in *Internal Control—Integrated Framework* (2013), concluded that our internal control over financial reporting was effective as of December 31, 2018.

The effectiveness of our internal control over financial reporting as of December 31, 2018 has been audited by Deloitte & independent registered public accounting firm, as stated in their report which appears on page K-62.

Berkshire Hathaway Inc.
February 23, 2019

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Item 8. Financial Statements and Supplementary Data

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of
Berkshire Hathaway Inc.
Omaha, Nebraska

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Berkshire Hathaway Inc. and subsidiaries (the "Company") as of I
and 2017, the related consolidated statements of earnings, comprehensive income, changes in shareholders' equity, and cash flows, fo
years in the period ended December 31, 2018, and the related notes (collectively referred to as the "financial statements"). We also
Company's internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control — Inte
(2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Co
December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended Dec
conformity with accounting principles generally accepted in the United States of America. Also, in our opinion, the Company mainta
respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Cont
Framework (2013)* issued by COSO.

Change in Accounting Principle

As discussed in Note 1 to the financial statements, the Company has changed its method of accounting for investments in equity sec
equity method investments) in 2018 due to the adoption of ASU 2016-01 "Financial Instruments – Recognition and Measurement o
and Financial Liabilities."

Basis for Opinions

The Company's management is responsible for these financial statements, for maintaining effective internal control over financial re
assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report or
Over Financial Reporting. Our responsibility is to express an opinion on these financial statements and an opinion on the Company
over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Overs
States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws
rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the a
reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud, and w
internal control over financial reporting was maintained in all material respects.

Our audits of the financial statements included performing procedures to assess the risks of material misstatement of the financial st
due to error or fraud, and performing procedures to respond to those risks. Such procedures included examining, on a test basis, evid
amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significa
by management, as well as evaluating the overall presentation of the financial statements. Our audit of internal control over financial
obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing
design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other p
considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM *(Continued)*

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliabi reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting princip internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that t recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and expenditures of the company are being made only in accordance with authorizations of management and directors of the company reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's asset material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projection of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or t compliance with the policies or procedures may deteriorate.

/s/ Deloitte & Touche LLP

Omaha, Nebraska
February 23, 2019

We have served as the Company's auditor since 1985.

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BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED BALANCE SHEETS
(dollars in millions)

	December 31, 2018	December 31, 2017
ASSETS		
Insurance and Other:		
Cash and cash equivalents*	$ 27,749	$ 28,673
Short-term investments in U.S. Treasury Bills	81,506	84,371
Investments in fixed maturity securities	19,898	21,353
Investments in equity securities	172,757	170,540
Equity method investments	17,325	21,024
Loans and finance receivables	16,280	13,748
Other receivables	31,564	29,392
Inventories	19,069	17,366
Property, plant and equipment	20,628	19,868
Equipment held for lease	14,298	10,167
Goodwill	56,323	56,478
Other intangible assets	31,499	32,518
Deferred charges under retroactive reinsurance contracts	14,104	15,278
Other	9,307	9,391
	532,307	530,167
Railroad, Utilities and Energy:		
Cash and cash equivalents*	2,612	2,910
Receivables	3,666	3,531
Property, plant and equipment	131,780	128,184
Goodwill	24,702	24,780
Regulatory assets	3,067	2,950
Other	9,660	9,573
	175,487	171,928
	$ 707,794	$ 702,095

* *Cash and cash equivalents includes U.S. Treasury Bills with maturities of three months or less when purchased of $3.9 billion at D and $5.7 billion at December 31, 2017.*

See accompanying Notes to Consolidated Financial Statements

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BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED BALANCE SHEETS
(dollars in millions)

	December 31, 2018	December 31, 2017
LIABILITIES AND SHAREHOLDERS' EQUITY		
Insurance and Other:		
Unpaid losses and loss adjustment expenses	$ 68,458	$ 61,122
Unpaid losses and loss adjustment expenses under retroactive reinsurance contracts	41,834	42,937
Unearned premiums	18,093	16,040
Life, annuity and health insurance benefits	18,632	17,608
Other policyholder liabilities	7,675	7,654
Accounts payable, accruals and other liabilities	25,776	24,569
Derivative contract liabilities	2,452	2,172
Aircraft repurchase liabilities and unearned lease revenues	4,593	—
Notes payable and other borrowings	34,975	40,409
	222,488	212,511
Railroad, Utilities and Energy:		
Accounts payable, accruals and other liabilities	11,410	11,334
Regulatory liabilities	7,506	7,511
Notes payable and other borrowings	62,515	62,178
	81,431	81,023
Income taxes, principally deferred	51,375	56,607
Total liabilities	355,294	350,141
Shareholders' equity:		
Common stock	8	8
Capital in excess of par value	35,707	35,694
Accumulated other comprehensive income	(5,015)	58,571
Retained earnings	321,112	255,786
Treasury stock, at cost	(3,109)	(1,763)
Berkshire Hathaway shareholders' equity	348,703	348,296
Noncontrolling interests	3,797	3,658
Total shareholders' equity	352,500	351,954
	$ 707,794	$ 702,095

See accompanying Notes to Consolidated Financial Statements

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BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF EARNINGS
(dollars in millions except per share amounts)

	Year Ended December 31,		
	2018	**2017**	**2016**
Revenues:			
Insurance and Other:			
Insurance premiums earned	$ 57,418	$ 60,597	$ 45,881
Sales and service revenues	133,336	130,343	123,053
Leasing revenues	5,732	2,452	2,553
Interest, dividend and other investment income	7,678	6,536	6,180
	204,164	199,928	177,667
Railroad, Utilities and Energy:			
Freight rail transportation revenues	23,703	21,080	19,683
Energy operating revenues	15,555	15,155	14,621
Service revenues and other income	4,415	3,770	3,143
	43,673	40,005	37,447
Total revenues	247,837	239,933	215,114
Investment and derivative contract gains (losses):			
Investment gains (losses)	(22,155)	1,410	7,553
Derivative contract gains (losses)	(300)	718	751
	(22,455)	2,128	8,304
Costs and expenses:			
Insurance and Other:			
Insurance losses and loss adjustment expenses	39,906	48,891	30,906
Life, annuity and health insurance benefits	5,699	5,618	5,131
Insurance underwriting expenses	9,793	9,321	7,713
Cost of sales and services	106,083	104,343	97,867
Cost of leasing	4,061	1,455	1,335
Selling, general and administrative expenses	18,238	19,189	17,973
Interest expense	1,035	1,132	1,099
	184,815	189,949	162,024
Railroad, Utilities and Energy:			
Freight rail transportation expenses	16,045	14,031	13,134
Utilities and energy cost of sales and other expenses	11,641	10,772	10,471
Other expenses	3,895	3,231	2,589
Interest expense	2,818	3,254	2,642
	34,399	31,288	28,836
Total costs and expenses	219,214	221,237	190,860
Earnings before income taxes and equity method earnings (losses)	6,168	20,824	32,558
Equity method earnings (losses)	(2,167)	3,014	1,109
Earnings before income taxes	4,001	23,838	33,667
Income tax expense (benefit)	(321)	(21,515)	9,240
Net earnings	4,322	45,353	24,427
Earnings attributable to noncontrolling interests	301	413	353
Net earnings attributable to Berkshire Hathaway shareholders	$ 4,021	$ 44,940	$ 24,074
Net earnings per average equivalent Class A share	$ 2,446	$ 27,326	$ 14,645
Net earnings per average equivalent Class B share*	$ 1.63	$ 18.22	$ 9.76
Average equivalent Class A shares outstanding	1,643,795	1,644,615	1,643,826
Average equivalent Class B shares outstanding	2,465,692,368	2,466,923,163	2,465,739,654

* *Class B shares are economically equivalent to one-fifteen-hundredth of a Class A share. Accordingly, net earnings per average eq share outstanding is equal to one-fifteen-hundredth of the equivalent Class A amount. See Note 21.*

See accompanying Notes to Consolidated Financial Statements

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BERKSHIRE HATHAWAY INC.
and Subsidiaries

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

(dollars in millions)

	Year Ended December 31, 2018	2017	2016
Net earnings	$ 4,322	$ 45,353	$ 24,427
Other comprehensive income:			
Net change in unrealized appreciation of investments	(185)	30,450	13,858
Applicable income taxes	31	(10,566)	(4,846)
Reclassification of investment appreciation in net earnings	(253)	(1,399)	(6,820)
Applicable income taxes	53	490	2,387
Foreign currency translation	(1,531)	2,364	(1,541)
Applicable income taxes	62	(95)	66
Prior service cost and actuarial gains/losses of defined benefit pension plans	(571)	225	354
Applicable income taxes	143	(45)	(187)
Other, net	(12)	(9)	(17)
Other comprehensive income, net	(2,263)	21,415	3,254
Comprehensive income	2,059	66,768	27,681
Comprehensive income attributable to noncontrolling interests	249	555	291
Comprehensive income attributable to Berkshire Hathaway shareholders	$ 1,810	$ 66,213	$ 27,390

BERKSHIRE HATHAWAY INC.
and Subsidiaries

CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY

(dollars in millions)

	Berkshire Hathaway shareholders' equity					
	Common stock and capital in excess of par value	Accumulated other comprehensive income	Retained earnings	Treasury stock	Non-controlling interests	Total
Balance December 31, 2015	$ 35,628	$ 33,982	$ 186,772	$ (1,763)	$ 3,077	$ 257,69
Net earnings	—	—	24,074	—	353	24,427
Other comprehensive income, net	—	3,316	—	—	(62)	3,254
Issuance of common stock	119	—	—	—	—	119
Transactions with noncontrolling interests	(58)	—	—	—	(10)	(68)
Balance December 31, 2016	35,689	37,298	210,846	(1,763)	3,358	285,428
Net earnings	—	—	44,940	—	413	45,353
Other comprehensive income, net	—	21,273	—	—	142	21,415
Issuance of common stock	76	—	—	—	—	76
Transactions with noncontrolling interests	(63)	—	—	—	(255)	(318)
Balance December 31, 2017	35,702	58,571	255,786	(1,763)	3,658	351,954
Adoption of new accounting pronouncements	—	(61,375)	61,305	—	—	(70)
Net earnings	—	—	4,021	—	301	4,322
Other comprehensive income, net	—	(2,211)	—	—	(52)	(2,263)
Issuance (acquisition) of common stock	59	—	—	(1,346)	—	(1,287)
Transactions with noncontrolling interests	(46)	—	—	—	(110)	(156)
Balance December 31, 2018	$ 35,715	$ (5,015)	$ 321,112	$ (3,109)	$ 3,797	$ 352,500

See accompanying Notes to Consolidated Financial Statements

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BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF CASH FLOWS
(dollars in millions)

	Year Ended December 31,		
	2018	2017	201
Cash flows from operating activities:			
Net earnings	$ 4,322	$ 45,353	$ 24,4
Adjustments to reconcile net earnings to operating cash flows:			
Investment gains/losses	22,155	(1,410)	(7,5
Depreciation and amortization	9,779	9,188	8,9
Other	2,957	458	(16
Changes in operating assets and liabilities:			
Losses and loss adjustment expenses	3,449	25,027	4,3
Deferred charges reinsurance assumed	1,174	(7,231)	(36
Unearned premiums	1,794	1,761	96
Receivables and originated loans	(3,443)	(1,990)	(3,3
Other assets	(1,832)	(1,665)	(37
Other liabilities	2,002	1,194	1,6
Income taxes	(4,957)	(24,957)	4,0
Net cash flows from operating activities	37,400	45,728	32,6
Cash flows from investing activities:			
Purchases of U.S. Treasury Bills and fixed maturity securities	(141,844)	(158,492)	(96,
Purchases of equity securities	(43,210)	(20,326)	(16,
Sales of U.S. Treasury Bills and fixed maturity securities	39,693	49,327	18,7
Redemptions and maturities of U.S. Treasury Bills and fixed maturity securities	113,045	86,727	26,
Sales and redemptions of equity securities	18,783	19,512	28,4
Purchases of loans and finance receivables	(1,771)	(1,435)	(30
Collections of loans and finance receivables	342	1,702	49
Acquisitions of businesses, net of cash acquired	(3,279)	(2,708)	(31,
Purchases of property, plant and equipment and equipment held for lease	(14,537)	(11,708)	(12,
Other	(71)	(3,608)	(37
Net cash flows from investing activities	(32,849)	(41,009)	(84,
Cash flows from financing activities:			
Proceeds from borrowings of insurance and other businesses	2,409	2,645	14,
Proceeds from borrowings of railroad, utilities and energy businesses	7,019	3,013	3,0
Repayments of borrowings of insurance and other businesses	(7,395)	(5,465)	(2,5
Repayments of borrowings of railroad, utilities and energy businesses	(4,213)	(3,549)	(2,1
Changes in short term borrowings, net	(1,943)	2,079	13
Acquisition of treasury stock	(1,346)	—	—
Other	(343)	(121)	11
Net cash flows from financing activities	(5,812)	(1,398)	12,7
Effects of foreign currency exchange rate changes	(140)	248	(17
Increase (decrease) in cash and cash equivalents and restricted cash	(1,401)	3,569	(38,
Cash and cash equivalents and restricted cash at beginning of year	32,212	28,643	67,6
Cash and cash equivalents and restricted cash at end of year *	$ 30,811	$ 32,212	$ 28,6
** Cash and cash equivalents and restricted cash at end of year are comprised of the following:*			
Insurance and Other	*$ 27,749*	*$ 28,673*	*$ 24,*
Railroad, Utilities and Energy	*2,612*	*2,910*	*3,9*
Restricted cash, included in other assets	*450*	*629*	*59*

$ 30,811	*$ 32,212*	*$ 28,[illegible]*

See accompanying Notes to Consolidated Financial Statements

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(1) Significant accounting policies and practices

(a) Nature of operations and basis of consolidation

Berkshire Hathaway Inc. (“Berkshire”) is a holding company owning subsidiaries engaged in a number of diverse b
including insurance and reinsurance, freight rail transportation, utilities and energy, manufacturing, service, retailing a
notes the terms “us,” “we,” or “our” refer to Berkshire and its consolidated subsidiaries. Further information regardi
business segments is contained in Note 26. Information concerning significant business acquisitions completed over t
appears in Note 2. The Consolidated Financial Statements for periods before 2018 reflect reclassifications to con
presentations. Most significantly, line items previously reported under the sub-caption Finance and Financial Pr
Consolidated Financial Statements were reclassified to corresponding line items in the Insurance and Other section
believe that reporting the Railroad, Utilities and Energy subsidiaries separately is appropriate given relative significa
assets, capital expenditures and debt, which is not guaranteed by Berkshire. In addition, certain amounts related to
investments were reclassified to conform to current year presentations.

The accompanying Consolidated Financial Statements include the accounts of Berkshire consolidated with the a
subsidiaries and affiliates in which we hold a controlling financial interest as of the financial statement date. Norma
financial interest reflects ownership of a majority of the voting interests. We consolidate variable interest entities (“
possess both the power to direct the activities of the VIE that most significantly affect its economic performance,
obligated to absorb the losses that could be significant to the VIE or (b) hold the right to receive benefits from the V
significant to the VIE. Intercompany accounts and transactions have been eliminated.

(b) Use of estimates in preparation of financial statements

The preparation of our Consolidated Financial Statements in conformity with accounting principles generally accep
States (“GAAP”) requires us to make estimates and assumptions that affect the reported amounts of assets and liabiliti
financial statements and the reported amounts of revenues and expenses during the period. In particular, estimates of
loss adjustment expenses are subject to considerable estimation error due to the inherent uncertainty in projecting ulti
addition, estimates and assumptions associated with the amortization of deferred charges on retroactive reinsura
determinations of fair values of certain financial instruments and evaluations of goodwill and identifiable intang
impairment require considerable judgment. Actual results may differ from the estimates used in preparing our Conso
Statements.

(c) Cash and cash equivalents and short-term investments in U.S. Treasury Bills

Cash equivalents consist of demand deposit and money market accounts and investments with maturities of three mo
purchased. Short-term investments in U.S. Treasury Bills with remaining maturities exceeding three months at the ti
stated at amortized cost, which approximates fair value.

(d) Investments in fixed maturity securities

We classify investments in fixed maturity securities at the acquisition date and re-evaluate the classification at each b
We carry held-to-maturity investments at amortized cost, reflecting the ability and intent to hold the securities to m
investments are securities acquired with the intent to sell in the near term and are carried at fair value with changes in
in earnings. All other fixed maturity securities are classified as available-for-sale and are carried at fair value with net
losses reported as a component of accumulated other comprehensive income. As of December 31, 2018, substant
investments in fixed maturity securities were classified as available-for-sale. We amortize the difference between the
maturity value of a fixed maturity security to earnings using the interest method.

(d) Investments in fixed maturity securities (Continued)

Investment gains and losses arise when fixed maturity securities are sold (as determined on a specific identification b than-temporarily impaired with respect to securities classified as available-for-sale. If the value of a fixed maturity inv below amortized cost and the decline is deemed to be other than temporary, the amortized cost of the investment is re with a corresponding charge to earnings. We recognize an other-than-temporary impairment if we (a) intend to sel required to sell the security before its amortized cost is recovered or (b) do not expect to ultimately recover the amorti if we do not intend to sell the security. Under scenario (a), we recognize the loss in earnings and under scenario (b), credit loss component in earnings and the difference between fair value and the amortized cost basis net of the cre comprehensive income.

(e) Investments in equity securities

We carry substantially all of our investments in equity securities at fair value and record the subsequent changes in Consolidated Statement of Earnings as a component of investment gains/losses. Prior to January 1, 2018, substantial security investments were classified as available-for-sale and were also carried at fair value. However, we recorded th in fair value of these securities as components of other comprehensive income and we recorded gains and losses in Statements of Earnings when equity securities were sold (on a specific identification basis) or were other-than-temp

(f) Investments under the equity method

We utilize the equity method to account for investments when we possess the ability to exercise significant influenc over the operating and financial policies of the investee. The ability to exercise significant influence is presumed w possesses more than 20% of the voting interests of the investee. This presumption may be overcome based on spe circumstances that demonstrate that the ability to exercise significant influence is restricted. We apply the equity met in common stock and to other investments when such other investments possess substantially identical subordinated i stock.

In applying the equity method, we record the investment at cost and subsequently increase or decrease the carryin investment by our proportionate share of the net earnings or losses and other comprehensive income of the investee. W or other equity distributions as reductions in the carrying value of the investment. In the event that net losses of the i carrying amount to zero, additional net losses may be recorded if other investments in the investee are at-risk, eve committed to provide financial support to the investee. Such additional equity method losses, if any, are based upon claim on the investee's book value.

(g) Receivables

Receivables primarily consists of balances due from customers, insurance premiums receivable and reinsurance reco losses. Receivables are stated net of estimated allowances for uncollectible balances. Allowances for uncollectible bal when it is probable counterparties or customers will be unable to pay all amounts due based on the contractual terr receivables against the allowances after all reasonable collection efforts are exhausted.

(h) Loans and finance receivables

Loans and finance receivables are predominantly manufactured housing installment loans. We carry these loans at am allowances for uncollectible accounts, based on our ability and intent to hold such loans to maturity. Acquisition origination and commitment costs paid or fees received along with acquisition premiums or discounts are amortized a over the lives of the loans. Substantially all of our loans and finance receivables are secured by real or personal pro assets of the borrower.

Allowances for credit losses on loans include estimates of losses on loans currently in foreclosure and losses on loar foreclosure. We estimate losses on loans in foreclosure based on historical experience and collateral recovery rates. E on loans not currently in foreclosure consider historical default rates, collateral recovery rates and prevailing econo Allowances for credit losses also incorporate the historical average time elapsed from the last payment until f

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(1) Significant accounting policies and practices *(Continued)*

(h) Loans and finance receivables (Continued)

Loans are considered delinquent when payments are more than 30 days past due. We place loans over 90 days past c status and accrued but uncollected interest is reversed. Subsequent collections on the loans are first applied to the pri owed for the most delinquent amount. We resume interest income accrual once a loan is less than 90 days de

Loans in the foreclosure process are considered non-performing. Once a loan is in foreclosure, interest income is not the foreclosure is cured or the loan is modified. Once a modification is complete, interest income is recognized based new loan. Foreclosed loans are charged off when the collateral is sold. Loans not in foreclosure are evaluated for ch individual circumstances concerning the future collectability of the loan and the condition of the collateral secu

(i) Derivatives

We carry derivative contracts in our Consolidated Balance Sheets at fair value, net of reductions permitted under agreements with counterparties. We record the changes in fair value of derivative contracts that do not qualify as hedg financial reporting purposes in earnings or by our regulated utilities businesses as regulatory assets or liabilities, as inclusion in regulated rates is probable.

(j) Fair value measurements

As defined under GAAP, fair value is the price that would be received to sell an asset or paid to transfer a liability participants in the principal market or in the most advantageous market when no principal market exists. Adjustmen prices or quoted market prices may be required in illiquid or disorderly markets in order to estimate fair value. Alte techniques may be appropriate under the circumstances to determine the value that would be received to sell an asset o liability in an orderly transaction. Market participants are assumed to be independent, knowledgeable, able and will exchange and not acting under duress. Our nonperformance or credit risk is considered in determining the fair val Considerable judgment may be required in interpreting market data used to develop the estimates of fair value. Accor fair value presented herein are not necessarily indicative of the amounts that could be realized in a current or future

(k) Inventories

Inventories consist of manufactured goods, goods acquired for resale, homes constructed for sale, and materials cons operations. Manufactured inventory costs include raw materials, direct and indirect labor and factory overhead. last-in-first-out ("LIFO") method to value approximately 39% of consolidated inventories at December 31, 2018 w primarily determined under first-in-first-out and average cost methods. Non-LIFO inventories are stated at the low realizable value. The excess of current or replacement costs over costs determined under LIFO were approximately December 31, 2018.

(l) Property, plant and equipment

We record additions to property, plant and equipment used in operations at cost, which includes asset additions, im betterments. With respect to constructed assets, all materials, direct labor and contract services as well as certain in capitalized. Indirect costs include interest over the construction period. With respect to constructed assets of our ut subsidiaries that are subject to authoritative guidance for regulated operations, capitalized costs also include an equ funds used during construction, which represents the cost of equity funds used to finance the construction of the regu Note 1(t).

Normal repairs and maintenance and other costs that do not improve the property, extend the useful life or otherw capitalization criteria are charged to expense as incurred. Rail grinding costs related to our railroad properties are exp

Depreciation of assets of our regulated utilities and railroad is generally determined using group depreciation metho based on periodic depreciation studies approved by the applicable regulator. Under group depreciation, a single dep applied to the gross investment in a particular class of property, despite differences in the service life or salvage va property units within the same class. When such assets are retired or sold, no gain or loss is recognized. Gains or loss all other assets are recorded through earnings.

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Notes to Consolidated Financial Statements *(Continued)*

(1) Significant accounting policies and practices *(Continued)*

(l) Property, plant and equipment (Continued)

We depreciate property, plant and equipment used by our other businesses to estimated salvage value primarily usin method over estimated useful lives. Ranges of estimated useful lives of depreciable assets used in our other business buildings and improvements – 5 to 50 years, machinery and equipment – 3 to 25 years and furniture, fixtures and oth Ranges of estimated useful lives of depreciable assets unique to our railroad business are as follows: track structure a 9 to 100 years and locomotives, freight cars and other equipment – 6 to 41 years. Ranges of estimated useful lives of regulated utilities and energy businesses are as follows: utility generation, transmission and distribution systems interstate natural gas pipeline assets – 3 to 80 years and independent power plants and other assets – 3 to 3

We evaluate property, plant and equipment for impairment when events or changes in circumstances indicate that th such assets may not be recoverable or when the assets are held for sale. Upon the occurrence of a triggering event, we estimated undiscounted cash flows expected from the use of the asset and the residual value from the ultimate disp exceeds the carrying value. If the carrying value exceeds the estimated recoverable amounts, we reduce the carrying and record an impairment loss in earnings, except with respect to impairment of assets of our regulated utility and e where the impacts of regulation are considered in evaluating the carrying value.

(m) Equipment held for lease

We record additions to equipment held for lease at cost. We depreciate equipment held for lease to estimated salvag using the straight-line method over estimated useful lives ranging from 6 to 35 years. We also evaluate equipment impairment consistent with policies for property, plant and equipment.

(n) Goodwill and other intangible assets

Goodwill represents the excess of the acquisition price of a business over the fair value of identified net assets of t evaluate goodwill for impairment at least annually. When evaluating goodwill for impairment, we estimate the fair va unit. There are several methods that may be used to estimate a reporting unit's fair value, including market quotation fair values and other valuation techniques, including, but not limited to, discounted projected future net earnings or multiples of earnings. If the carrying amount of a reporting unit, including goodwill, exceeds the estimated fair identifiable assets and liabilities of the reporting unit are estimated at fair value as of the current testing date. The exc fair value of the reporting unit over the current estimated fair value of net assets establishes the implied value of good the recorded goodwill over the implied goodwill value is charged to earnings as an impairment loss. Significant judg estimating the fair value of the reporting unit and performing goodwill impairment tests.

We amortize intangible assets with finite lives in a pattern that reflects the expected consumption of related econom straight-line basis over the estimated economic lives. Intangible assets with finite lives are reviewed for impairmen changes in circumstances indicate that the carrying amount may not be recoverable. Intangible assets with indefinite impairment at least annually and when events or changes in circumstances indicate that, more-likely-than-not, the

(o) Revenue recognition

We earn insurance premiums on prospective property/casualty insurance and reinsurance contracts over the loss exp period in proportion to the level of protection provided. In most cases, such premiums are earned ratably over the te with unearned premiums computed on a monthly or daily pro-rata basis. Premiums on retroactive property/casualty re are earned at the inception of the contracts, as all of the underlying loss events covered by the policies occurred pr Premiums for life reinsurance and annuity contracts are earned when due. Premiums earned are stated net of amounts Premiums earned on contracts with experience-rating provisions reflect estimated loss experience under such

Notes to Consolidated Financial Statements *(Continued)*

(1) Significant accounting policies and practices *(Continued)*

(o) Revenue recognition (Continued)

On January 1, 2018, we adopted Accounting Standards Codification ("ASC") 606 "Revenues from Contracts with Cu described in Note 1(w), our revenue recognition practices for contracts with customers under ASC 606 do not differ prior practices. Under ASC 606, revenues are recognized when a good or service is transferred to a customer. A go transferred when (or as) the customer obtains control of that good or service. Revenues are based on the considerat receive in connection with our promises to deliver goods and services to our customers.

We manufacture and/or distribute a wide variety of industrial, building and consumer products. Our sales contracts p with these products through wholesale and retail channels in exchange for consideration specified under the contr generally represent customer orders for individual products at stated prices. Sales contracts may contain either sin performance obligations. In instances where contracts contain multiple performance obligations, we allocate the r obligation based on the relative stand-alone selling prices of each product or service.

Sales revenue reflects reductions for returns, allowances, volume discounts and other incentives, some of which may future events. In certain customer contracts, sales revenue includes certain state and local excise taxes billed to custo products when those taxes are levied directly upon us by the taxing authorities. Sales revenue excludes sales taxes and collected on behalf of taxing authorities. Sales revenue includes consideration for shipping and other fulfillment act prior to the customer obtaining control of the goods. We also elect to treat consideration for such services performed passed to the customer as sales revenue.

Our product sales revenues are generally recognized at a point in time when control of the product transfers to the coincides with customer pickup or product delivery or acceptance, depending on terms of the arrangement. We recog and related costs with respect to certain contracts over time, primarily from certain castings, forgings and aerostru Control of the product units under these contracts transfers continuously to the customer as the product is manufactur generally have no alternative use and the contract requires the customer to provide reasonable compensation if term other than breach of contract.

Our energy revenue derives primarily from tariff based sales arrangements approved by various regulatory commiss based revenues are mainly comprised of energy, transmission, distribution and natural gas and have performance obl energy products and services to customers which are satisfied over time as energy is delivered or services are provided energy revenue primarily relates to our renewable energy business. Energy revenues are equivalent to the amounts w invoice and correspond directly with the value to the customer of the performance to date and include billed and u Payments from customers are generally due from the customer within 30 days of billing. Rates charged for energy pr are established by regulators or contractual arrangements that establish the transaction price, as well as the allocation the separate performance obligations. When preliminary regulated rates are permitted to be billed prior to final approv regulator, certain revenue collected may be subject to refund and a liability for estimated refunds is acc

The primary performance obligation under our freight rail transportation service contracts is to move freight from a p point of destination. The performance obligations are represented by bills of lading which create a series of distinct s similar pattern of transfer to the customer. The revenues for each performance obligation are based on various fact product being shipped, the origin and destination pair, and contract incentives which are outlined in various private common carrier public tariffs, interline foreign road agreements and pricing quotes. The transaction price is generally transport railcars from a specified origin to a specified destination. Freight revenues are recognized over time as the s because the customer simultaneously receives and consumes the benefits of the service. Revenues recognized represe the service completed as of the balance sheet date. Invoices for freight transportation services are generally issued to within 30 days or less. Customer incentives, which are primarily provided for shipping a specified cumulative volur from specific locations, are recorded as a reduction to revenue on a pro-rata basis based on actual or projected future c

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(1) Significant accounting policies and practices *(Continued)*

(o) Revenue recognition (Continued)

Other service revenues derive from contracts with customers in which performance obligations are satisfied over tim receive and consume benefits as we perform the services, or at a point in time when the services are provided. Othe primarily derive from real estate brokerage, automotive repair, aircraft management, aviation training, franchising an services.

Leasing revenue is generally recognized ratably over the term of the lease or based on usage, if applicable under t contract. A substantial portion of our leases are classified as operating leases. Prior to January 1, 2018, we recognize sales of fractional ownership interests in aircraft over the term of the related management services agreements, as th ownership interests were inseparable from the management services agreements. These agreements also include prov us to repurchase the fractional interest at fair market value at contract termination or upon the customer's request foll minimum commitment period. ASC 606 provides that such contracts are subject to accounting guidance for lease con 606. The re-characterization of these fractional ownership interests as operating leases did not have a significan consolidated revenues or earnings.

(p) Losses and loss adjustment expenses

We record liabilities for unpaid losses and loss adjustment expenses assumed under short duration property/casual reinsurance contracts for loss events that have occurred on or before the balance sheet date. Such liabilities represe ultimate payment amounts without discounting for time value.

We base liability estimates on (1) reports of losses from policyholders, (2) individual case estimates and (3) estimates reported losses. Losses and loss adjustment expenses in the Consolidated Statements of Earnings include paid claims costs and changes in estimated claim liabilities. Losses and loss adjustment expenses charged to earnings are net of a and estimates of recoverable amounts under ceded reinsurance contracts. Reinsurance contracts do not relieve the ced obligations to indemnify policyholders with respect to the underlying insurance and reinsurance contra

(q) Retroactive reinsurance contracts

We record liabilities for unpaid losses and loss adjustment expenses assumed under retroactive reinsurance of short consistent with other short duration property/casualty insurance and reinsurance contracts discussed in Note 1(p). retroactive reinsurance contracts, we also record deferred charge assets at the inception of the contracts, representing t the estimated ultimate claim liabilities over the premiums earned. We subsequently amortize the deferred charge asset claim settlement periods using the interest method. Changes to the estimated timing or amount of future loss paym changes in deferred charge balances. We apply changes in such estimates retrospectively and the resulting changes i balances, together with periodic amortization, are included in insurance losses and loss adjustment expenses in th Statements of Earnings.

(r) Insurance policy acquisition costs

We capitalize the incremental costs that directly relate to the successful sale of insurance contracts, subject to ultimat we subsequently amortize such costs to underwriting expenses as the related premiums are earned. Direct incrementa include commissions, premium taxes and certain other costs associated with successful efforts. We expense all other as incurred. The recoverability of capitalized insurance policy acquisition costs generally reflects anticipation of inve unamortized balances are included in other assets and were $2,658 million and $2,529 million at December 31, 2 respectively.

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(1) Significant accounting policies and practices *(Continued)*

(s) Life and annuity insurance benefits

We compute our liabilities for insurance benefits under life contracts based upon estimated future investment yields, morbidity, and lapse or withdrawal rates as well as estimates of premiums we expect to receive and expenses we exp future. These assumptions, as applicable, also include a margin for adverse deviation and may vary with the chara contract's date of issuance, policy duration and country of risk. The interest rate assumptions used may vary by contr We discount periodic payment annuity liabilities based on the implicit rate as of the inception of the contracts such th of the liabilities equals the premiums. Discount rates range from less than 1% to 7%.

(t) Regulated utilities and energy businesses

Certain energy subsidiaries prepare their financial statements in accordance with authoritative guidance for regula reflecting the economic effects of regulation from the ability to recover certain costs from customers and the requi revenues to customers in the future through the regulated rate-setting process. Accordingly, certain costs are deferred and certain income is accrued as regulatory liabilities. Regulatory assets and liabilities will be amortized into operat revenues over various future periods.

Regulatory assets and liabilities are continually assessed for probable future inclusion in regulatory rates by consider applicable regulatory or legislative changes and recent rate orders received by other regulated entities. If future inclu rates ceases to be probable, the amount no longer probable of inclusion in regulatory rates is charged or credited to comprehensive income, if applicable) or returned to customers.

(u) Foreign currency

The accounts of our non-U.S. based subsidiaries are measured, in most instances, using functional currencies other th Revenues and expenses of these subsidiaries are translated into U.S. Dollars at the average exchange rate for the per liabilities are translated at the exchange rate as of the end of the reporting period. Gains or losses from translating the of these subsidiaries are included in shareholders' equity as a component of accumulated other comprehensive incom arising from transactions denominated in a currency other than the functional currency of the reporting entity, includi from the remeasurement of assets and liabilities due to changes in currency exchange rates, are included in

(v) Income taxes

Berkshire files a consolidated federal income tax return in the United States, which includes eligible subsidiaries. In income tax returns in state, local and foreign jurisdictions as applicable. Provisions for current income tax liabilities accrued on income and expense amounts expected to be included in the income tax returns for the current year. Incon earnings also include deferred income tax provisions.

Deferred income tax assets and liabilities are computed on differences between the financial statement bases and tax liabilities at the enacted tax rates. Changes in deferred income tax assets and liabilities associated with compon comprehensive income are charged or credited directly to other comprehensive income. Otherwise, changes in deferre and liabilities are included as a component of income tax expense. The effect on deferred income tax assets and liabil changes in enacted tax rates are charged or credited to income tax expense in the period of enactment. Valuation established for certain deferred tax assets when realization is not likely.

Assets and liabilities are established for uncertain tax positions taken or positions expected to be taken in income tax positions, in our judgment, do not meet a more-likely-than-not threshold based on the technical merits of the positions and penalties related to uncertain tax positions are included as a component of income tax expense

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(1) Significant accounting policies and practices *(Continued)*

(w) New accounting pronouncements adopted in 2018

On January 1, 2018, we adopted Accounting Standards Update ("ASU") 2016-01 "Financial Instruments—Rec Measurement of Financial Assets and Financial Liabilities," ASU 2018-02 "Reclassification of Certain Tax Effects f Other Comprehensive Income" and ASC 606. Prior year financial statements were not restated. A summary of the ef adoption of ASU 2016-01, ASU 2018-02 and ASC 606 follows (in millions).

	ASU 2016-01	ASU 2018-02	ASC 606	Total
Increase (decrease):				
Assets	$ —	$ —	$ 3,382	$
Liabilities	—	—	3,453	
Accumulated other comprehensive income	(61,459)	84	—	(6
Retained earnings	61,459	(84)	(70)	6
Shareholders' equity	—	—	(70)	

With respect to ASU 2016-01, beginning in 2018, unrealized gains and losses from the changes in the fair values of o during the period are included within investment gains (losses) in the Consolidated Statements of Earnings. For perio January 1, 2018, we recognized gains and losses in earnings when we sold equity securities and for other-than-temp losses and we recorded unrealized gains and losses from the changes in fair value of such securities in other compreh of January 1, 2018, we reclassified net after-tax unrealized gains on equity securities from accumulated other compre retained earnings.

In adopting ASU 2018-02, we reclassified the stranded deferred income tax effects arising from the reduction in th income tax rate under the U.S. Tax Cuts and Jobs Act that were included in accumulated other comprehensive incom 2018 to retained earnings. The effect of the reduction in the U.S statutory income tax rate on other comprehensive i recorded in earnings in December 2017.

In adopting ASC 606, we recorded increases to certain assets and other liabilities, with the cumulative net effect rec earnings. Prior to January 1, 2018, we recognized revenues from the sales of fractional ownership interests in aircraft related management services agreements, as the transfers of the ownership interests were inseparable from the man agreements. These agreements also include provisions that require us to repurchase the fractional interest at fair mark termination or upon the customer's request following the end of a minimum commitment period. ASC 606 provides are subject to accounting guidance for lease contracts. The principal effects of this re-characterization were to increa for lease and aircraft repurchase liabilities and unearned lease revenues by approximately $3.5 billio

(x) New accounting pronouncements to be adopted subsequent to December 31, 2018

In February 2016, the Financial Accounting Standards Board ("FASB") issued ASU 2016-02 "Leases," which togeth amendments is included in ASC 842 "Leases." Most significantly, ASC 842 requires a lessee to recognize a liabili payments and an asset with respect to its right to use the underlying asset for the lease term. ASC 842 also addresse reporting by lessors, which is not significantly different from current accounting and reporting, and further provides quantitative disclosures. We adopted ASC 842 as of January 1, 2019 under the modified retrospective method with contracts in effect as of the adoption date.

We are party to contracts where we are the lessee and other contracts where we are the lessor. For contracts where we consolidated assets and liabilities increased by approximately $6 billion as of January 1, 2019, primarily due to th right-of-use assets and lease liabilities with respect to operating leases. We do not believe the adoption of ASC 842 w effect on our consolidated financial position, results of operations or cash flows.

(x) New accounting pronouncements to be adopted subsequent to December 31, 2018 (Continued)

In June 2016, the FASB issued ASU 2016-13 "Financial Instruments—Credit Losses," which provides for the re measurement at the reporting date of all expected credit losses for financial assets held at amortized cost and for avai securities. Currently, credit losses are recognized and measured when such losses become probable based on the pre circumstances. ASU 2016-13 is effective for reporting periods beginning after December 15, 2019. We are currently e this standard will have on our Consolidated Financial Statements.

In January 2017, the FASB issued ASU 2017-04 "Simplifying the Test for Goodwill Impairment." ASU 2017-04 requirement to determine the implied value of goodwill in measuring an impairment loss. Upon adoption of ASU measurement of a goodwill impairment will represent the excess of the reporting unit's carrying value over its fair limited to the carrying value of goodwill. ASU 2017-04 is effective for goodwill impairment tests in fiscal years b December 15, 2019, with early adoption permitted.

In August 2018, the FASB issued ASU 2018-12 "Targeted Improvements to the Accounting for Long-Duration Contra requires periodic reassessment of actuarial and discount rate assumptions used in the valuation of policyholder liabil acquisition costs arising from the issuance of long-duration insurance and reinsurance contracts, with the effects of ch assumptions reflected in earnings and the effects of changes in discount rate assumptions reflected in other compre Under current accounting guidance, the actuarial and discount rate assumptions are set at the contract inception subsequently changed, except under limited circumstances. ASU 2018-12 also requires new disclosures and is effecti beginning after December 15, 2020, with early adoption permitted. We are evaluating the effect this standard wi Consolidated Financial Statements.

(2) Significant business acquisitions

Our long-held acquisition strategy is to acquire businesses that have consistent earning power, good returns on equity and management. Financial results attributable to business acquisitions are included in our Consolidated Financial Statements beginning acquisition dates.

In 2016, National Indemnity Company ("NICO"), a wholly-owned subsidiary, entered into a definitive agreement to acquire Mutual Insurance Company ("Medical Liability Mutual"), a writer of medical professional liability insurance domiciled in New Yor price was approximately $2.5 billion. The acquisition closed on October 1, 2018, at which time, Medical Liability Mutual's name MLMIC Insurance Company ("MLMIC"). As of the acquisition date, the fair value of MLMIC's assets was approximately $6.1 billi ($230 million) and investments ($5.2 billion), and liabilities were approximately $3.6 billion, consisting primarily of unpaid losses a expenses ($3.2 billion). MLMIC premiums earned for the year ending December 31, 2018 were approximately $400 mi

In each of the past three years, we also completed several smaller-sized business acquisitions, which we consider as "bolt-on existing business operations. Aggregate consideration paid for bolt-on acquisitions was approximately $1.0 billion in 2018, $2.7 bi $1.4 billion in 2016. We do not believe that these acquisitions are material, individually or in the aggregate to our Consolidated Fina

On January 29, 2016, Berkshire acquired all outstanding common stock of Precision Castparts Corp. ("PCC") for cash o $32.7 billion, which included the value of PCC shares we already owned. We funded the acquisition with a combination of existing proceeds from a temporary credit facility. PCC is a worldwide, diversified manufacturer of complex metal components and produ aerospace, power and general industrial markets. PCC also produces titanium and nickel superalloy melted and mill products for the a processing, oil and gas and pollution control industries, and manufactures extruded seamless pipe, fittings and forgings for power ger gas applications.

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(2) Significant business acquisitions *(Continued)*

On February 29, 2016, we acquired a recapitalized Duracell Company ("Duracell") from The Procter & Gamble Compa
exchange for shares of P&G common stock held by Berkshire subsidiaries, which had a fair value of approximately $4.2 billion. Du
high-performance alkaline batteries and wireless charging technologies. Goodwill from these acquisitions is not amortizable for inc
The fair values of identified assets acquired and liabilities assumed and residual goodwill at their respective acquisition dates are sum
(in millions).

	PCC	Duracell
Cash and cash equivalents	$ 250	$ 1,807
Inventories	3,430	319
Property, plant and equipment	2,765	359
Goodwill	16,011	866
Other intangible assets	23,527	1,550
Other assets	1,916	242
Assets acquired	$ 47,899	$ 5,143
Accounts payable, accruals and other liabilities	$ 2,442	$ 410
Notes payable and other borrowings	5,251	—
Income taxes, principally deferred	7,548	494
Liabilities assumed	$ 15,241	$ 904
Net assets	$ 32,658	$ 4,239

(3) Investments in fixed maturity securities

Investments in fixed maturity securities as of December 31, 2018 and 2017 are summarized by type below (in m

	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
December 31, 2018				
U.S. Treasury, U.S. government corporations and agencies	$ 4,223	$ 22	$ (22)	$ 4,223
States, municipalities and political subdivisions	182	7	—	189
Foreign governments	7,480	50	(28)	7,502
Corporate bonds	7,055	408	(23)	7,440
Mortgage-backed securities	487	59	(2)	544
	$ 19,427	$ 546	$ (75)	$ 19,898
December 31, 2017				
U.S. Treasury, U.S. government corporations and agencies	$ 3,975	$ 4	$ (26)	$ 3,953
States, municipalities and political subdivisions	847	19	(12)	854
Foreign governments	8,572	274	(24)	8,822
Corporate bonds	6,279	588	(5)	6,862
Mortgage-backed securities	772	92	(2)	862
	$ 20,445	$ 977	$ (69)	$ 21,353

Investments in foreign governments include securities issued by national and provincial government entities as well as ins
unconditionally guaranteed by such entities. As of December 31, 2018, approximately 88% of our foreign government holdings were
by at least one of the major rating agencies.

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(3) Investments in fixed maturity securities *(Continued)*

The amortized cost and estimated fair value of fixed maturity securities at December 31, 2018 are summarized below by co dates. Amounts are in millions. Actual maturities may differ from contractual maturities due to early call or prepayment rights h

	Due in one year or less	Due after one year through five years	Due after five years through ten years	Due after ten years	Mortgage-backed securities	Total
Amortized cost	$ 6,973	$ 10,937	$ 438	$ 592	$ 487	$ 19,427
Fair value	6,982	10,994	494	884	544	19,898

(4) Investments in equity securities

Investments in equity securities as of December 31, 2018 and 2017 are summarized based on the primary industry of the in below (in millions).

	Cost Basis	Net Unrealized Gains	Fair Value
*December 31, 2018 **			
Banks, insurance and finance	$ 44,332	$ 38,260	$ 82,592
Consumer products	38,783	22,838	61,621
Commercial, industrial and other	19,752	8,792	28,544
	$ 102,867	$ 69,890	$ 172,757

* *Approximately 68% of the aggregate fair value was concentrated in five companies (American Express Company – $14.5 billio $40.3 billion; Bank of America Corporation – $22.6 billion; The Coca-Cola Company – $18.9 billion and Wells Fargo & Compan*

	Cost Basis	Net Unrealized Gains	Fair Value
*December 31, 2017 **			
Banks, insurance and finance	$ 25,783	$ 55,026	$ 80,809
Consumer products	25,177	25,698	50,875
Commercial, industrial and other	23,716	15,140	38,856
	$ 74,676	$ 95,864	$ 170,540

* *Approximately 65% of the aggregate fair value was concentrated in five companies (American Express Company – $15.1 billio $28.2 billion; Bank of America Corporation – $20.7 billion; The Coca-Cola Company – $18.4 billion and Wells Fargo & Compan*

In 2011, we acquired 50,000 shares of 6% Non-Cumulative Perpetual Preferred Stock of Bank of America Corporation (liquidation value of $100,000 per share (“BAC Preferred”) and warrants to purchase up to 700,000,000 shares of common stock o Warrants”) at $7.142857 per share (up to $5 billion in the aggregate). On August 24, 2017, we exercised all of our BAC Warrant 700,000,000 shares of BAC common stock. We also surrendered substantially all of our BAC Preferred as payment of the $5 billion BAC Warrants and acquire the BAC common stock. Our investment in BAC is included in the banks, insurance and finance

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(5) Equity method investments

Berkshire and its subsidiaries hold investments in certain businesses that are accounted for pursuant to the equity method. C significant of these is our investment in the common stock of The Kraft Heinz Company ("Kraft Heinz"). Kraft Heinz is one of th manufacturers and marketers of food and beverage products, including condiments and sauces, cheese and dairy, meals, meats, refre coffee and other grocery products.

Berkshire currently owns 325,442,152 shares of Kraft Heinz common stock representing 26.7% of the outstanding shares Heinz common stock are publicly-traded and the fair value of our investment at December 31, 2018 and 2017 was approximately $ $25.3 billion, respectively. Our carrying value of this investment at December 31, 2018 and 2017 was approximately $13.8 billion a respectively. We recorded equity method losses in 2018 of approximately $2.7 billion compared to earnings of $2.9 billion in 2017 a 2016. Our losses in 2018 included our share of intangible asset impairment losses recorded by Kraft Heinz. In 2017, our earnings ref certain one-time effects of the Tax Cuts and Jobs Act of 2017 on Kraft Heinz's net earnings. We received dividends on the com $814 million and $797 million in 2018 and 2017, respectively, which we recorded as reductions of our investment

Summarized unaudited financial information of Kraft Heinz follows (in millions).

	December 29, 2018	December 30, 2017
Assets	$ 103,627	$ 120,232
Liabilities	51,721	53,985

	Year ending December 29, 2018	Year ending December 30, 2017	Year ending December 31, 2016
Sales	$ 26,259	$ 26,085	$ 26,335
Net earnings (losses) attributable to Kraft Heinz common shareholders	$ (10,229)	$ 10,999	$ 3,452

Other investments accounted for pursuant to the equity method include our investments in Berkadia Commercial Mortgage Pilot Travel Centers LLC, d/b/a Pilot Flying J ("Pilot Flying J"), and Electric Transmission Texas, LLC ("ETT"). The carrying value in these entities was approximately $3.5 billion as of December 31, 2018 and $3.4 billion as of December 31, 2017. Our equity metho entities were $563 million in 2018, $76 million in 2017 and $186 million in 2016. Additional information concerning these inves

We own a 50% interest in Berkadia, with Jefferies Financial Group Inc. ("Jefferies"), formerly known as Leucadia Natio owning the other 50% interest. Berkadia is a servicer of commercial real estate loans in the U.S., performing primary, master and s functions for U.S. government agency programs, commercial mortgage-backed securities transactions, banks, insurance companies a institutions. A source of funding for Berkadia's operations is through its issuance of commercial paper, which is currently limited to December 31, 2018, Berkadia's commercial paper outstanding was $1.47 billion. The commercial paper is supported by a surety p Berkshire insurance subsidiary. Jefferies is obligated to indemnify us for one-half of any losses incurred under the policy. In addit Hathaway Energy Company subsidiary owns a 50% interest in ETT, an owner and operator of electric transmission assets in the El Council of Texas footprint. American Electric Power owns the other 50% interest.

On October 3, 2017, we entered into an investment agreement and an equity purchase agreement whereby we acquired a 38. Flying J, headquartered in Knoxville, Tennessee. Pilot Flying J is one of the largest operators of travel centers in North America, with team members, 750 locations across the U.S. and Canada, and more than $20 billion in annual revenues. The Haslam family curren interest in Pilot Flying J and a third party owns the remaining 11.3% interest. We also entered into an agreement to acquire in 2023 a interest in Pilot Flying J with the Haslam family retaining a 20% interest. As a result, Berkshire will become the majority owner of 2023.

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(6) Investment gains/losses

Investment gains/losses for each of the three years ending December 31, 2018 are summarized below (in milli

	2018	2017	2016
Equity securities:			
Unrealized investment gains/losses on securities held at the end of the period	$ (22,729)	$ —	$ —
Investment gains/losses during 2018 on securities sold in 2018	291	—	—
Gross realized gains	—	2,237	7,853
Gross realized losses	—	(919)	(415)
	(22,438)	1,318	7,438
Fixed maturity securities:			
Gross realized gains	480	103	58
Gross realized losses	(227)	(22)	(51)
Other	30	11	108
	$ (22,155)	$ 1,410	$ 7,553

Prior to 2018, we recognized investment gains and losses in earnings when we sold or otherwise disposed of equity secur difference between the proceeds from the sale and the cost of the securities and also when we recognized other-than-temporary im Beginning in 2018, equity securities gains and losses include unrealized gains and losses from changes in fair values during the p securities we still own. See Note 1(w). Prior to 2018, we recorded the changes in unrealized gains and losses on our investments in other comprehensive income.

During 2018, as reflected in the Consolidated Statement of Cash Flows, we received proceeds of approximately $18.8 bill equity securities. In the preceding table, investment gains/losses on equity securities sold during 2018 reflect the difference between and the fair value of the equity security sold at the beginning of the period or the purchase date, if later. Our taxable gains on equit during 2018, which are generally the difference between the proceeds from sales and our original cost, were $3.3 bill

Net gains from equity securities in 2017 included approximately $1.0 billion related to the surrender of substantially all of as described in Note 4. Gross gains from equity securities in 2016 included approximately $4.2 billion from the redemptions of our i Wrigley Jr. Company and Kraft Heinz preferred stock and from the sale of Dow Chemical Company common stock received in the Dow Chemical preferred stock investment. In 2016, we also recorded a non-cash holding gain of approximately $1.1 billion from the common stock in connection with the acquisition of Duracell. See Note 2.

(7) Loans and finance receivables

Loans and finance receivables are summarized as follows (in millions).

	December 31, 2018	December 31, 2017
Loans and finance receivables before allowances and discounts	$ 16,622	$ 14,126
Allowances for uncollectible loans	(177)	(180)
Unamortized acquisition discounts	(165)	(198)
	$ 16,280	$ 13,748

Loans and finance receivables are predominantly installment loans originated or acquired by our manufactured housing bu for loan losses for 2018 and 2017 were $141 million and $160 million, respectively. Loan charge-offs, net of recoveries, were $144 r $162 million in 2017. At December 31, 2018, approximately 98% of the manufactured housing loan balances were evaluated co impairment, with the remainder evaluated individually. As part of the evaluation process, credit quality indicators are reviewed and lo as performing or non-performing. At December 31, 2018, we considered approximately 99% of the loan balances to be performing a 95% of the loan balances to be current as to payment status.

Additionally, during 2018, an insurance subsidiary entered into an agreement with Seritage Growth Properties to provide a loan facility, which matures on July 31, 2023. As of December 31, 2018, the outstanding loans under the facility were approximat

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Notes to Consolidated Financial Statements *(Continued)*

(8) Other receivables

Other receivables of insurance and other businesses are comprised of the following (in millions).

	December 31, 2018	December 31, 2017
Insurance premiums receivable	$ 12,452	$ 11,058
Reinsurance recoverable on unpaid losses	3,060	3,201
Trade receivables	12,617	12,031
Other	3,823	3,464
Allowances for uncollectible accounts	(388)	(362)
	$ 31,564	$ 29,392

Receivables of our railroad and our utilities and energy businesses are comprised of the following (in millio

	December 31, 2018	December 31, 2017
Trade receivables	$ 3,433	$ 3,346
Other	362	313
Allowances for uncollectible accounts	(129)	(128)
	$ 3,666	$ 3,531

Trade receivables include unbilled revenue of $554 million and $665 million as of December 31, 2018 and 2017, respectiv the regulated utility businesses.

(9) Inventories

Inventories are comprised of the following (in millions).

	December 31, 2018	December 31, 2017
Raw materials	$ 4,182	$ 3,479
Work in process and other	2,625	2,568
Finished manufactured goods	4,541	4,505
Goods acquired for resale	7,721	6,814
	$ 19,069	$ 17,366

(10) Property, plant and equipment

A summary of property, plant and equipment of our insurance and other businesses follows (in millions).

	December 31, 2018	December 31, 2017
Land	$ 2,536	$ 2,523
Buildings and improvements	9,959	9,409
Machinery and equipment	22,574	21,190
Furniture, fixtures and other	4,758	4,519
	39,827	37,641
Accumulated depreciation	(19,199)	(17,773)
	$ 20,628	$ 19,868

Notes to Consolidated Financial Statements *(Continued)*

(10) Property, plant and equipment *(Continued)*

A summary of property, plant and equipment of our railroad and our utilities and energy businesses follows (in millions). Th transmission and distribution systems and interstate natural gas pipeline assets are owned by regulated public utility and natura subsidiaries.

	December 31, 2018	December 31, 2017
Railroad:		
Land, track structure and other roadway	$ 59,509	$ 57,408
Locomotives, freight cars and other equipment	13,016	12,543
Construction in progress	664	989
	73,189	70,940
Accumulated depreciation	(10,004)	(8,627)
	63,185	62,313
Utilities and energy:		
Utility generation, transmission and distribution systems	77,288	74,660
Interstate natural gas pipeline assets	7,524	7,176
Independent power plants and other assets	8,324	7,499
Construction in progress	3,110	2,556
	96,246	91,891
Accumulated depreciation	(27,651)	(26,020)
	68,595	65,871
	$ 131,780	$ 128,184

Depreciation expense for each of the three years ending December 31, 2018 is summarized below (in millio

	2018	2017	2016
Insurance and other	$ 2,186	$ 2,116	$ 2,017
Railroad, utilities and energy	5,098	4,852	4,639
	$ 7,284	$ 6,968	$ 6,656

(11) Equipment held for lease

Equipment held for lease is summarized below (in millions). Equipment held for lease includes railcars, aircraft, over-th intermodal tank containers, cranes, storage units and furniture. In conjunction with the adoption of ASC 606, we recorded a net asse $3.5 billion related to aircraft sold under fractional aircraft ownership programs in aircraft. Such amount included cost of approximat of accumulated depreciation of $1.8 billion. We also recorded other liabilities of approximately $3.5 billion for estimated aircraft rep and unearned lease revenues, substantially offsetting the amount recorded in aircraft. See Note 1(w).

	December 31, 2018	December 31, 2017
Railcars	$ 8,862	$ 8,352
Aircraft	7,376	1,456
Other equipment held for lease	4,379	3,967
	20,617	13,775
Accumulated depreciation	(6,319)	(3,608)
	$ 14,298	$ 10,167

Depreciation expense for equipment held for lease was $1,102 million in 2018, $751 million in 2017 and $755 million
December 31, 2018, the minimum future lease rentals to be received on equipment held for lease were as follows (in millions): 2019
$1,771; 2021 – $1,222; 2022 – $779; 2023 – $421; and thereafter – $377.

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(12) Goodwill and other intangible assets

Reconciliations of the changes in the carrying value of goodwill during 2018 and 2017 follows (in million

	December 31, 2018	December 31, 2017
Balance at beginning of year	$ 81,258	$ 79,486
Acquisitions of businesses	376	1,545
Other, including foreign currency translation	(609)	227
Balance at end of year	$ 81,025	$ 81,258

Our other intangible assets and related accumulated amortization are summarized as follows (in millions)

	December 31, 2018		December 31, 2017	
	Gross carrying amount	Accumulated amortization	Gross carrying amount	Accumulated amortization
Insurance and other	$ 40,493	$ 8,994	$ 40,225	$ 7,707
Railroad, utilities and energy	1,011	362	988	324
	$ 41,504	$ 9,356	$ 41,213	$ 8,031
Trademarks and trade names	$ 5,368	$ 750	$ 5,381	$ 692
Patents and technology	4,446	2,790	4,341	2,493
Customer relationships	28,375	4,573	28,322	3,722
Other	3,315	1,243	3,169	1,124
	$ 41,504	$ 9,356	$ 41,213	$ 8,031

Intangible asset amortization expense was $1,393 million in 2018, $1,469 million in 2017 and $1,490 million in 2016. Esti expense over the next five years is as follows (in millions): 2019 – $1,318; 2020 – $1,224; 2021 – $1,136; 2022 – $1,063 and 2023 – assets with indefinite lives as of December 31, 2018 and 2017 were $18.9 billion and primarily related to certain customer relationsh and trade names.

(13) Derivative contracts

We are party to derivative contracts through certain of our subsidiaries. Currently, the most significant derivative contract index put option contracts. The liabilities and related notional values of these contracts follows (in millions).

	Liabilities	Notional Value
December 31, 2018	$ 2,452	$ 26,759
December 31, 2017	2,172	28,753

Notional value represents the aggregate undiscounted amounts payable assuming that the value of each index is zero at expiration date. Certain of these contracts are denominated in foreign currencies. Notional amounts are based on the foreign currenc of each balance sheet date.

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(13) Derivative contracts *(Continued)*

We recorded derivative contract losses of $300 million in 2018 and gains of $718 million in 2017, with respect to our equit contracts. The losses in 2018 were primarily due to decreases in equity index values during the fourth quarter. Derivative contract g $751 million, which included $662 million related to equity index put option contracts and $89 million related to a credit default c terminated.

The equity index put option contracts are European style options written prior to March 2008 on four major equity indexe contracts expire between April 2019 and October 2025. At December 31, 2018, the remaining weighted average life of all contracts 1.9 years. In 2018, one equity index put option contract expired and another contract was terminated by mutual agreement with the c contracts had an aggregate notional value of approximately $1.2 billion. Contracts with notional values of $12.2 billion will ex

Future payments, if any, under any given contract will be required if the prevailing index value is below the contract str expiration date. We received aggregate premiums of $4.0 billion on the remaining contracts at the contract inception dates and we ha credit risk. The aggregate intrinsic value (the undiscounted liability assuming the contracts are settled based on the index values anc exchange rates as of the balance sheet date) was $1,653 million at December 31, 2018 and $789 million at December 31, 2017. These be unilaterally terminated or fully settled before the expiration dates and the ultimate amount of cash basis gains or losses on these co determined until the contract expiration dates.

A limited number of our equity index put option contracts contain collateral posting requirements with respect to changes i intrinsic value of the contracts and/or a downgrade of Berkshire's credit ratings. As of December 31, 2018, we did not have any co requirements. If Berkshire's credit ratings (currently AA from Standard & Poor's and Aa2 from Moody's) are downgraded belo Standard & Poor's or A3 by Moody's, collateral of up to $1.1 billion could be required to be posted.

Our regulated utility subsidiaries are exposed to variations in the prices of fuel required to generate electricity, wholesale el and sold and natural gas supplied for customers. We may use forward purchases and sales, futures, swaps and options to manage a po risks. Most of the net derivative contract assets or liabilities of our regulated utilities are probable of recovery through rates and are c liabilities or assets. Derivative contract assets are included in other assets and were $172 million as of December 31, 2018 and $1 December 31, 2017. Derivative contract liabilities are included in accounts payable, accruals and other liabilities and were $111 December 31, 2018 and $82 million as of December 31, 2017.

(14) Supplemental cash flow information

A summary of supplemental cash flow information for each of the three years ending December 31, 2018 is presented in the millions).

	2018	2017	2016
Cash paid during the period for:			
Income taxes	$4,354	$ 3,286	$ 4,719
Interest:			
Insurance and other	1,111	1,260	944
Railroad, utilities and energy	2,867	2,828	2,788
Non-cash investing and financing activities:			
Liabilities assumed in connection with business acquisitions	3,735	747	16,555
Equity securities exchanged in connection with business acquisitions	—	—	4,239
Conversions and other exchanges of investments	—	—	4,154
Equity securities surrendered in connection with warrant exercise	—	4,965	—

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(15) Unpaid losses and loss adjustment expenses

Our liabilities for unpaid losses and loss adjustment expenses (also referred to as "claim liabilities") under short duration pr insurance and reinsurance contracts are based upon estimates of the ultimate claim costs associated with claim occurrences as of the and include estimates for incurred-but-not-reported ("IBNR") claims. A reconciliation of the changes in claim liabilities, excluding retroactive reinsurance contracts (see Note 16), for each of the three years ending December 31, 2018 is as follows (in mi

	2018	2017	2016
Balances – beginning of year:			
Gross liabilities	$ 61,122	$ 53,379	$ 50,519
Reinsurance recoverable on unpaid losses	(3,201)	(3,338)	(3,307)
Net liabilities	57,921	50,041	47,212
Incurred losses and loss adjustment expenses:			
Current accident year events	39,876	37,702	30,636
Prior accident years' events	(1,406)	(544)	(1,443)
Total incurred losses and loss adjustment expenses	38,470	37,158	29,193
Paid losses and loss adjustment expenses:			
Current accident year events	(18,391)	(17,425)	(14,898)
Prior accident years' events	(15,452)	(12,507)	(10,929)
Total payments	(33,843)	(29,932)	(25,827)
Foreign currency translation adjustment	(331)	654	(537)
Business acquisition	3,181	—	—
Balances – end of year:			
Net liabilities	65,398	57,921	50,041
Reinsurance recoverable on unpaid losses	3,060	3,201	3,338
Gross liabilities	$ 68,458	$ 61,122	$ 53,379

Incurred losses and loss adjustment expenses in the preceding table were recorded in earnings in each period and related occurring in the current year ("current accident year") and events occurring in all prior years ("prior accident years"). Current accid 2018 included $1.6 billion from four significant catastrophe events, while current accident year losses in 2017 included approximate six significant catastrophe events during that year. As discussed in Note 2, NICO acquired MLMIC, a writer of medical professional on October 1, 2018.

Incurred losses and loss adjustment expenses from the net reductions of estimated ultimate liabilities for prior accide $1,406 million in 2018, $544 million in 2017 and $1,443 million in 2016. These reductions, as percentages of the net liabilities at the year, were 2.4% in 2018, 1.1% in 2017 and 3.1% in 2016.

Estimated ultimate liabilities for prior years' loss events related to primary insurance were decreased $937 million in 201 2017 and $569 million in 2016. These decreases were primarily attributable to lower than anticipated medical malpractice and work losses. Liabilities for prior years' private passenger auto claims were also reduced in 2018 and 2016, but were increased i

Estimated ultimate liabilities for prior years' loss events related to property and casualty reinsurance were reduced $469 $295 million in 2017 and $874 million in 2016. The decrease in 2017 was net of increased losses from a United Kingdom governme to the computation of certain personal injury lump sum settlements and higher than expected property losses.

Estimated claim liabilities for environmental, asbestos and other latent injury exposures, net of reinsurance recoverable, w $1.7 billion at December 31, 2018 and $1.6 billion at December 31, 2017. These liabilities are subject to change due to changes i regulatory environment as described in Note 16. We are unable to reliably estimate additional losses or a range of losses that are reas these claims.

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(15) Unpaid losses and loss adjustment expenses *(Continued)*

A reconciliation of the disaggregated net unpaid losses and allocated loss adjustment expenses (the latter referred to as "Al
Berkshire Hathaway Reinsurance Group ("BHRG") and Berkshire Hathaway Primary Group ("BH Primary") to our consolidated un
adjustment expenses as of December 31, 2018, follows (in millions).

	GEICO	BHRG Property	BHRG Casualty	BH Primary Medical Professional Liability	BH Primary Workers' Compensation and Other Casualty	Total
Unpaid losses and ALAE, net	$ 17,318	$ 9,395	$ 19,966	$ 7,288	$ 8,694	$ 62,661
Reinsurance recoverable	896	312	850	53	940	3,051
Unpaid unallocated loss adjustment expenses						2,015
Other unpaid losses and loss adjustment expenses						731
Unpaid losses and loss adjustment expenses						$ 68,458

GEICO

GEICO's claim liabilities predominantly relate to various types of private passenger auto liability and physical damage clai
we establish and evaluate unpaid claim liabilities using standard actuarial loss development methods and techniques. The actuaria
historical claims data, adjusted when deemed appropriate to reflect perceived changes in loss patterns. Claim liabilities include av
development and IBNR estimates.

We establish average liabilities based on expected severities for newly reported physical damage and liability claims prior
individual case reserve when we have insufficient time or information to make specific claim estimates and for a large number of
damage claims that once reported are quickly settled. We establish liability case loss estimates, which includes loss adjustment expe
and merits of the claim are evaluated.

Estimates for liability coverages are more uncertain primarily due to the longer claim-tails, the greater chance of protracte
incompleteness of facts at the time the case estimate is first established. The "claim-tail" is the time period between the claim occu
settlement date. Consequently, we establish additional case development liabilities, which are usually percentages of the case liabilit
claims, IBNR liabilities are estimated by projecting the ultimate number of claims expected (reported and unreported) for each signi
deducting reported claims to produce estimated unreported claims. The product of the average cost per unreported claim and the nu
claims produces the IBNR liability estimate. We may record supplemental IBNR liabilities in certain situations when actuarial techni
apply.

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(15) Unpaid losses and loss adjustment expenses *(Continued)*

GEICO's incurred and paid losses and ALAE, net of reinsurance, are summarized by accident year below. IBNR and ca liabilities are as of December 31, 2018. Claim counts are established when accidents that may result in a liability are reported and a coverage. Each claim event may generate claims under multiple coverages, and thus may result in multiple counts. The "Cumula Reported Claims" includes the combined number of reported claims for all policy coverages and excludes projected IBNR claims millions.

	Incurred Losses and ALAE through December 31,						
Accident Year	2014*	2015*	2016*	2017*	2018	IBNR and Case Development Liabilities	Cumulative Number of Reported Claims (in thousands)
2014	$ 14,680	$ 14,572	$ 14,559	$ 14,589	$ 14,651	$ 148	7,976
2015		16,887	16,875	16,993	17,039	319	8,926
2016			19,106	19,390	19,364	823	9,633
2017				22,675	22,257	2,208	10,816
2018					24,120	4,659	10,968
Incurred losses and ALAE					$ 97,431		

	Cumulative Paid Losses and ALAE through December 31,				
Accident Year	2014*	2015*	2016*	2017*	2018
2014	$ 9,199	$ 12,036	$ 13,140	$ 13,850	$ 14,273
2015		10,606	13,858	15,285	16,186
2016			12,020	15,862	17,493
2017				13,878	18,249
2018					14,498
Paid losses and ALAE					80,699
Net unpaid losses and ALAE for 2014 – 2018 accident years					16,732
Net unpaid losses and ALAE for accident years before 2014					586
Net unpaid losses and ALAE					$ 17,318

* *Unaudited supplemental information*

BHRG

We use a variety of actuarial methodologies to establish BHRG's property and casualty claims liabilities. We use certain m as paid and incurred loss development techniques, incurred and paid loss Bornhuetter-Ferguson techniques and frequency and seve well as ground-up techniques when appropriate.

Our claims liabilities are principally a function of reported losses from ceding companies, case development and IBNR liab loss estimates are reported under our contracts either individually or in bulk as provided under the terms of the contracts. We ma evaluate case losses reported by the ceding company, and if deemed appropriate, we may establish case liabilities based on our est IBNR liabilities are driven by expected case loss emergence patterns and expected loss ratios, which may be evaluated as groups contracts with similar exposures, or on an individual contract-by-contract basis. Case and IBNR liability estimates for major catastr based on a per-contract assessment of the ultimate cost associated with the individual loss event. Claim count data is not provided, as not provided consistently by ceding companies under our contracts or is otherwise considered unreliable.

(15) Unpaid losses and loss adjustment expenses *(Continued)*

Incurred and paid losses and ALAE of BHRG are disaggregated based on losses that are expected to have shorter claim-ta losses expected to have longer claim-tails (casualty). Under certain contracts, the coverage can apply to multiple lines of business wr company, whether property, casualty or combined, and the ceding company may not report loss data by such lines consistently, if instances, we allocated losses to property and casualty coverages based on internal estimates. BHRG's disaggregated incurred and ALAE are summarized by accident year, net of reinsurance. IBNR and case development liabilities are as of December 31, 2018. Dol

BHRG Property

Accident Year	Incurred Losses and ALAE through December 31, 2009*	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017*	2018	IBNR and Developr Liabilit
2009	$ 2,366	$ 2,037	$ 2,232	$ 2,154	$ 2,058	$ 2,031	$ 1,990	$ 1,985	$1,984	$ 1,984	$
2010		2,523	2,380	2,408	2,274	2,180	2,145	2,126	2,106	2,114	23
2011			4,300	4,084	3,810	3,720	3,719	3,689	3,666	3,652	52
2012				3,144	2,833	2,629	2,389	2,336	2,333	2,315	65
2013					3,196	3,039	2,695	2,604	2,584	2,524	105
2014						2,621	2,427	2,315	2,171	2,115	120
2015							3,244	3,088	2,531	2,938	136
2016								3,267	3,906	3,625	583
2017									5,248	4,958	600
2018										4,373	2,125
	Incurred losses and ALAE									$ 30,598	

Accident Year	Cumulative Paid Losses and ALAE through December 31, 2009*	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017*	2018
2009	$ 402	$ 1,110	$ 1,613	$ 1,777	$ 1,846	$ 1,916	$ 1,950	$ 1,959	$ 1,961	$ 1,963
2010		336	1,024	1,506	1,772	1,931	1,987	2,033	2,058	2,065
2011			701	2,282	2,931	3,200	3,310	3,398	3,440	3,485
2012				266	1,222	1,801	1,939	2,028	2,103	2,123
2013					516	1,427	1,866	2,063	2,184	2,264
2014						465	1,244	1,569	1,708	1,773
2015							569	1,590	1,940	2,135
2016								703	1,792	2,187
2017									1,026	2,713
2018										910
	Paid losses and ALAE									21,618
	Net unpaid losses and ALAE for 2009 – 2018 accident years									8,980
	Net unpaid losses and ALAE for accident years before 2009									415
	Net unpaid losses and ALAE									$ 9,395

* *Unaudited supplemental information*

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(15) Unpaid losses and loss adjustment expenses *(Continued)*

BHRG Casualty

Accident Year	Incurred Losses and ALAE through December 31, 2009*	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017*	2018	IBNR and Developm Liabilit
2009	$ 2,375	$2,687	$ 2,546	$ 2,476	$ 2,414	$ 2,339	$ 2,292	$ 2,231	$2,192	$ 2,209	$
2010		2,301	2,387	2,322	2,258	2,139	2,090	2,044	1,883	1,963	228
2011			2,609	2,696	2,567	2,508	2,418	2,327	2,320	2,282	363
2012				2,789	2,964	2,799	2,864	2,793	2,682	2,615	514
2013					2,130	2,259	2,290	2,134	2,082	2,028	544
2014						1,867	2,061	2,029	1,991	1,905	611
2015							1,875	2,072	2,099	2,000	647
2016								1,903	2,107	2,014	818
2017									2,189	2,676	1,14
2018										2,917	1,85
				Incurred losses and ALAE						$ 22,609	

Accident Year	Cumulative Paid Losses and ALAE through December 31, 2009*	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017*	2018
2009	$ 247	$ 852	$ 940	$ 1,211	$ 1,430	$ 1,586	$ 1,622	$ 1,658	$1,684	$ 1,716
2010		118	546	838	1,026	1,278	1,374	1,437	1,482	1,531
2011			292	817	1,160	1,400	1,489	1,581	1,659	1,698
2012				309	749	1,140	1,370	1,527	1,651	1,750
2013					291	521	807	935	1,039	1,140
2014						150	478	644	753	875
2015							196	491	714	834
2016								253	556	734
2017									231	568
2018										267
				Paid losses and ALAE						11,113
				Net unpaid losses and ALAE for 2009 – 2018 accident years						11,496
				Net unpaid losses and ALAE for accident years before 2009						8,470
				Net unpaid losses and ALAE						$ 19,966

** Unaudited supplemental information*

BH Primary

BH Primary’s liabilities for unpaid losses and loss adjustment expenses primarily derive from medical professional liabil compensation and other casualty insurance, including commercial auto and general liability insurance. Incurred and paid losses summarized by accident year in the following tables, disaggregated by medical professional liability and workers’ compensation a coverages. IBNR and case development liabilities are as of December 31, 2018. The cumulative number of reported claims reflec individual claimants, and includes claims that ultimately result in no liability or payment. Dollars are in millions.

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(15) Unpaid losses and loss adjustment expenses *(Continued)*

BH Primary Medical Professional Liability

We estimate the ultimate expected incurred losses and loss adjustment expenses for medical professional claim liabilities accepted actuarial methodologies such as the paid and incurred development method, Bornhuetter-Ferguson based methods, hinds severity method, trended severity method and trended pure premium method. Using a combination of these methodologies produc estimates from which we determine our best estimate. Periodically, we study developments in older accident years and adjust initia reflect recent development based upon claim age, coverage and litigation experience. As previously noted, MLMIC was acquired o MLMIC's incurred and paid losses and ALAE are included for all years presented retrospectively.

Accident Year	Incurred Losses and ALAE through December 31,										IBNR and Case Development Liabilities
	2009*	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017*	2018	
2009	$ 1,423	$ 1,349	$ 1,294	$ 1,251	$ 1,153	$ 1,060	$ 988	$ 941	$ 922	$ 904	$ 22
2010		1,399	1,346	1,348	1,329	1,234	1,140	1,085	1,031	1,006	43
2011			1,346	1,334	1,321	1,262	1,173	1,115	1,050	1,004	71
2012				1,336	1,306	1,277	1,223	1,168	1,078	1,035	108
2013					1,328	1,296	1,261	1,195	1,127	1,086	160
2014						1,370	1,375	1,305	1,246	1,218	296
2015							1,374	1,342	1,269	1,290	450
2016								1,392	1,416	1,414	641
2017									1,466	1,499	1,011
2018										1,602	1,410
						Incurred losses and ALAE				$ 12,058	

Accident Year	Cumulative Paid Losses and ALAE through December 31,									
	2009*	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017*	2018
2009	$ 5	$ 90	$ 203	$ 350	$ 480	$ 619	$ 699	$ 753	$ 789	$ 810
2010		15	95	224	377	526	654	745	810	853
2011			16	82	200	356	517	632	711	767
2012				15	93	218	377	522	642	725
2013					15	90	219	368	518	635
2014						21	106	238	396	540
2015							23	108	218	382
2016								22	115	274
2017									27	128
2018										35
						Paid losses and ALAE				5,149
				Net unpaid losses and ALAE for 2009 – 2018 accident years						6,909
				Net unpaid losses and ALAE for accident years before 2009						379
					Net unpaid losses and ALAE					$ 7,288

* *Unaudited supplemental information*

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(15) Unpaid losses and loss adjustment expenses *(Continued)*

BH Primary Workers' Compensation and Other Casualty

We periodically evaluate ultimate loss and loss adjustment expense estimates for the workers' compensation and other casua combination of commonly accepted actuarial methodologies such as the Bornhuetter-Ferguson and chain-ladder approaches using pa data. Paid and incurred loss data is segregated and analyzed by state due to the different state regulatory frameworks that may impa including the duration and amount of loss payments. We also separately study the various components of liabilities, such employee l expenses and the costs of claims investigations and administration. We establish case liabilities for reported claims based upon circumstances of the claim. The excess of the ultimate projected losses, including the expected development of case estimates, an liabilities is included in IBNR liabilities.

Accident Year	Incurred Losses and ALAE through December 31,										IBNR and Case Development Liabilities	Cumulati Number o Reporte Claims (in thousan
	2009*	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017*	2018		
2009	$ 732	$ 673	$ 676	$ 632	$ 609	$ 595	$ 589	$ 585	$ 576	$ 562	$ 40	46
2010		715	675	644	609	589	584	576	562	553	42	47
2011			786	706	709	657	653	647	632	622	72	51
2012				907	887	876	828	815	792	779	105	63
2013					1,339	1,310	1,257	1,210	1,173	1,148	188	83
2014						1,866	1,737	1,716	1,641	1,572	287	112
2015							2,314	2,244	2,156	2,124	445	133
2016								2,656	2,561	2,475	833	127
2017									3,262	3,122	1,395	143
2018										3,761	2,459	142
					Incurred losses and ALAE					$ 16,718		

Accident Year	Cumulative Paid Losses and ALAE through December 31,									
	2009*	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017*	2018
2009	$ 99	$ 228	$ 328	$ 389	$ 434	$ 464	$ 488	$ 499	$ 503	$ 507
2010		106	250	327	393	437	465	479	484	491
2011			114	222	344	415	470	498	512	522
2012				101	301	422	515	576	607	627
2013					193	452	650	776	842	887
2014						247	581	837	1,046	1,155
2015							297	715	1,044	1,328
2016								332	792	1,181
2017									467	1,078
2018										570
					Paid losses and ALAE					8,346
					Net unpaid losses and ALAE for 2009 – 2018 accident years					8,372
					Net unpaid losses and ALAE for accident years before 2009					322
					Net unpaid losses and ALAE					$ 8,694

** Unaudited supplemental information*

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(15) Unpaid losses and loss adjustment expenses *(Continued)*

Supplemental unaudited average historical claims duration information based on the net losses and ALAE incurred and paic in the preceding tables follows. The percentages show the average portions of net losses and ALAE paid by each succeeding yea representing the current accident year.

Average Annual Percentage Payout of Incurred Losses by Age, Net of Reinsurance

In Year	1	2	3	4	5	6	7	8
GEICO	61.7%	19.6%	8.1%	4.9%	2.8%			
BHRG Property	19.0%	36.1%	18.3%	7.9%	4.3%	3.0%	1.5%	1.0%
BHRG Casualty	10.4%	17.8%	11.5%	8.5%	7.4%	5.1%	3.0%	1.9%
BH Primary Medical Professional Liability	1.6%	7.3%	11.5%	14.5%	14.1%	12.4%	8.4%	6.0%
BH Primary Workers' Compensation and Other Casualty	15.8%	21.5%	16.5%	12.0%	7.6%	4.6%	2.9%	1.5%

(16) Retroactive reinsurance contracts

Retroactive reinsurance policies provide indemnification of losses and loss adjustment expenses of short-duration insuran respect to underlying loss events that occurred prior to the contract inception date. Claims payments may commence immediately aft or, if applicable, once a contractual retention amount has been reached. Reconciliations of the changes in estimated liabilities for retr unpaid losses and loss adjustment expenses ("claim liabilities") and related deferred charge reinsurance assumed assets for each of th December 31, 2018 follows (in millions).

	2018		2017		
	Unpaid losses and loss adjustment expenses	Deferred charges reinsurance assumed	Unpaid losses and loss adjustment expenses	Deferred charges reinsurance assumed	Unpaid and l adjustr expen
Balances – beginning of year	$ 42,937	$ (15,278)	$ 24,972	$ (8,047)	$ 24.
Incurred losses and loss adjustment expenses					
Current year contracts	603	(86)	19,005	(7,730)	2,
Prior years' contracts	(341)	1,260	(41)	499	(
Total	262	1,174	18,964	(7,231)	2,
Paid losses and loss adjustment expenses	(1,365)	—	(999)	—	(1,
Balances – end of year	$ 41,834	$ (14,104)	$ 42,937	$ (15,278)	$ 24.
Incurred losses and loss adjustment expenses, net of deferred charges	$ 1,436		$ 11,733		$ 1,

In the preceding table, classifications of incurred losses and loss adjustment expenses are based on the inception dates of th not believe that analysis of losses incurred and paid by accident year of the underlying event is relevant or meaningful given that our incepts when the contract incepts. Further, we believe the classifications of reported claims and case development liabilities has litt analytical value.

In 2017, NICO entered into an agreement with various subsidiaries of American International Group, Inc. (collectively, "AI effective on February 2, 2017. Under this agreement, NICO agreed to indemnify AIG for 80% of up to $25 billion of losses and adjustment expenses in excess of $25 billion retained by AIG, with respect to certain commercial insurance loss events occurring pr the effective date, we recorded premiums earned of $10.2 billion, and we also recorded a liability for unpaid losses and loss adjustm $16.4 billion and a deferred charge reinsurance assumed asset of $6.2 billion. Berkshire agreed to guarantee the timely payment of a AIG under the agreement.

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(16) Retroactive reinsurance contracts *(Continued)*

In the fourth quarter of 2017, we increased our estimated ultimate claim liabilities under the aforementioned AIG contract $1.8 billion based on higher than expected loss payments reported by AIG under the contractual retention. We also increased the rela asset by $1.7 billion based on our re-estimation of the amounts and timing of future claim payments. The estimated ultimate claim lia to the AIG contract were approximately $18.2 billion at December 31, 2018 and at December 31, 2017 and the related deferred ch approximately $6.9 billion at December 31, 2018 and $7.5 billion at December 31, 2017.

Incurred losses and loss adjustment expenses related to contracts written in prior years were $919 million in 2018, $458 m $451 million in 2016, which included recurring amortization of deferred charges and the effect of changes in the timing and amount loss payments.

In establishing retroactive reinsurance claim liabilities, we analyze historical aggregate loss payment patterns and project lo under various probability-weighted scenarios. We expect the claim-tail to be very long for many contracts, with some lasting seve monitor claim payment activity and review ceding company reports and other information concerning the underlying losses. We reas expected timing and amounts of ultimate losses periodically or when significant events are revealed through our monitoring and re

Our retroactive reinsurance claim liabilities include estimated liabilities for environmental, asbestos and other latent inju approximately $13.1 billion at December 31, 2018 and $14.0 billion at December 31, 2017. Retroactive reinsurance contracts are ge aggregate policy limits and thus, our exposure to such claims under these contracts is likewise limited. We monitor evolving case la environmental and other latent injury claims. Changing government regulations, newly identified toxins, newly reported claims, new new contract interpretations and other factors could result in increases in these liabilities, which could be material to our results of o unable to reliably estimate the amount of additional net loss or the range of net loss that is reasonably possible.

(17) Notes payable and other borrowings

Notes payable and other borrowings are summarized below (in millions). The weighted average interest rates and maturity in the following tables are based on borrowings as of December 31, 2018.

	Weighted Average Interest Rate	December 31, 2018	December 31, 2017
Insurance and other:			
Berkshire Hathaway Inc. (“Berkshire”):			
U.S. Dollar denominated borrowings due 2019-2047	3.1%	$ 9,065	$ 10,603
Euro denominated borrowings due 2020-2035	1.1%	7,806	8,164
Berkshire Hathaway Finance Corporation (“BHFC”) due 2019-2048	3.4%	10,650	12,926
Subsidiary borrowings due 2019-2045	4.0%	5,597	6,884
Short-term subsidiary borrowings	4.3%	1,857	1,832
		$ 34,975	$ 40,409

The carrying value of Berkshire’s Euro denominated senior notes reflects the Euro/U.S. Dollar exchange rate as of the balan gains or losses arising from the changes in the Euro/U.S. Dollar exchange rate during the period are recorded in earnings as a comp general and administrative expenses. Changes in the Euro/U.S. Dollar exchange rate resulted in pre-tax gains of $366 million in $990 million in 2017 and gains of $264 million in 2016. The carrying values of the Euro denominated senior notes reflected corresp with respect to the gains and increases with respect to the losses in those periods.

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(17) Notes payable and other borrowings *(Continued)*

Borrowings of BHFC, a wholly owned finance subsidiary of Berkshire, consist of senior unsecured notes used to fund mar loans originated or acquired and equipment held for lease of certain finance subsidiaries. In August 2018, BHFC issued $2.35 billi notes due in 2048. During 2018, BHFC repaid $4.6 billion of maturing senior notes. During January 2019, BHFC issued $1.25 billi notes due in 2049 and repaid $950 million of maturing notes. Such borrowings are fully and unconditionally guaranteed by Berksh BHFC's borrowings, Berkshire guaranteed approximately $1.7 billion of other subsidiary borrowings at December 31, 2018. Gene guarantee of a subsidiary's debt obligation is an absolute, unconditional and irrevocable guarantee for the full and prompt paymen payment obligations.

	Weighted Average Interest Rate	December 31, 2018	December 31, 2017
Railroad, utilities and energy:			
Berkshire Hathaway Energy Company ("BHE") and subsidiaries:			
BHE senior unsecured debt due 2020-2049	4.6%	$ 8,577	$ 6,452
Subsidiary and other debt due 2019-2064	4.7%	28,196	28,739
Short-term debt	3.1%	2,516	4,488
Burlington Northern Santa Fe and subsidiaries due 2019-2097	4.7%	23,226	22,499
		$ 62,515	$ 62,178

BHE subsidiary debt represents amounts issued pursuant to separate financing agreements. Substantially all of the assets subsidiaries are, or may be, pledged or encumbered to support or otherwise secure debt. These borrowing arrangements generally covenants, including covenants which pertain to leverage ratios, interest coverage ratios and/or debt service coverage ratios. During subsidiaries issued approximately $5.5 billion of long-term debt. The debt issued in 2018 has maturity dates ranging from 2020 to 2 average interest rate of 3.6%. Proceeds from these debt issuances were used to repay debt, to fund capital expenditures and for ge purposes.

BNSF's borrowings are primarily senior unsecured debentures. In 2018, BNSF issued $1.5 billion of senior unsecured debe These debentures have a weighted average interest rate of 4.1%. As of December 31, 2018, BNSF, BHE and their subsidiaries were all applicable debt covenants. Berkshire does not guarantee any debt, borrowings or lines of credit of BNSF, BHE or their su

As of December 31, 2018, our subsidiaries had unused lines of credit and commercial paper capacity aggregating approxim support short-term borrowing programs and provide additional liquidity. Such unused lines of credit included approximately $6.1 bil and its subsidiaries.

Debt principal repayments expected during each of the next five years are as follows (in millions).

	2019	2020	2021	2022	2023
Insurance and other	$ 6,760	$ 2,811	$ 3,261	$ 1,616	$ 5,371
Railroad, utilities and energy	5,452	2,778	2,260	3,346	4,066
	$ 12,212	$ 5,589	$ 5,521	$ 4,962	$ 9,437

(18) Income taxes

The liabilities for income taxes reflected in our Consolidated Balance Sheets are as follows (in millions).

	December 31, 2018	December 31, 2017
Currently payable (receivable)	$ 323	$ (129)
Deferred	50,503	56,182
Other	549	554
	$ 51,375	$ 56,607

(18) Income taxes *(Continued)*

On December 22, 2017, President Trump signed into law legislation known as the Tax Cuts and Jobs Act of 2017 ("TCJ provisions, the TCJA reduced the statutory U.S. Corporate income tax rate from 35% to 21% effective January 1, 2018. The TCJA one-time tax on certain accumulated undistributed post-1986 earnings of foreign subsidiaries. Further, the TCJA includes provisio instances, impose U.S. income tax liabilities on future earnings of foreign subsidiaries and limit the deductibility of future interest ex also provides for accelerated deductions of certain capital expenditures made after September 27, 2017 through bonus depreciation. the TCJA may change due to regulations subsequently issued by the U.S. Treasury Department.

Upon the enactment of the TCJA, we recorded a reduction in our deferred income tax liabilities of approximately $35.6 bill the aforementioned change in the U.S. statutory income tax rate. As a result, we recorded an income tax benefit of approximately $2 increased regulatory liabilities of our regulated utility subsidiaries by approximately $6.0 billion for the portion of the deferred inc reduction that we will be required to, effectively, refund to customers in the rate setting process. We also recognized an income approximately $1.4 billion with respect to the deemed repatriation of the accumulated undistributed post-1986 earnings of our fore Thus, upon the enactment of the TCJA, we included a net income tax benefit in our 2017 earnings of approximately $28.2 billion. In our estimate of the income taxes on the deemed repatriation of earnings of foreign subsidiaries by $141 million and recognized ad income tax rate change effects.

We have not established deferred income taxes on accumulated undistributed earnings of certain foreign subsidiaries, which reinvested indefinitely. Repatriation of all accumulated earnings of foreign subsidiaries would be impracticable to the extent that such capital to support normal business operations. Generally, no U.S. federal income taxes will be imposed on future distributions of fore the current law. However, distributions to the U.S. or other foreign jurisdictions could be subject to withholding and other lo

The tax effects of temporary differences that give rise to significant portions of deferred tax assets and deferred tax liabilitie (in millions).

	December 31,	
	2018	2017
Deferred tax liabilities:		
Investments – unrealized appreciation and cost basis differences	$ 17,765	$ 24,251
Deferred charges reinsurance assumed	2,970	3,226
Property, plant and equipment	28,279	26,671
Goodwill and other intangible assets	7,199	7,204
Other	3,187	3,216
	59,400	64,568
Deferred tax assets:		
Unpaid losses and loss adjustment expenses	(1,238)	(1,231)
Unearned premiums	(767)	(345)
Accrued liabilities	(1,956)	(2,501)
Regulatory liabilities	(1,673)	(1,707)
Other	(3,263)	(2,602)
	(8,897)	(8,386)
Net deferred tax liability	$ 50,503	$ 56,182

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(18) Income taxes *(Continued)*

Income tax expense reflected in our Consolidated Statements of Earnings for each of the three years ending December 31, (in millions).

	2018	2017	2016
Federal	$ (1,613)	$ (23,427)	$ 7,796
State	175	894	556
Foreign	1,117	1,018	888
	$ (321)	$ (21,515)	$ 9,240
Current	$ 5,176	$ 3,299	$ 6,565
Deferred	(5,497)	(24,814)	2,675
	$ (321)	$ (21,515)	$ 9,240

Income tax expense is reconciled to hypothetical amounts computed at the U.S. federal statutory rate for each of the thr December 31, 2018 in the table below (in millions).

	2018	2017	2016
Earnings before income taxes	$ 4,001	$ 23,838	$ 33,667
Hypothetical income tax expense computed at the U.S. federal statutory rate	$ 840	$ 8,343	$ 11,783
Dividends received deduction and tax exempt interest	(393)	(905)	(789)
State income taxes, less U.S. federal income tax benefit	138	465	361
Foreign tax rate differences	271	(339)	(421)
U.S. income tax credits	(711)	(636)	(518)
Non-taxable exchange of investments	—	—	(1,143)
Net benefit from the enactment of the TCJA	(302)	(28,200)	—
Other differences, net	(164)	(243)	(33)
	$ (321)	$ (21,515)	$ 9,240

We file income tax returns in the United States and in state, local and foreign jurisdictions. We are under examination by th in many of these jurisdictions. We have settled income tax liabilities with the U.S. federal taxing authority ("IRS") for tax years thro continues to audit Berkshire's consolidated U.S. federal income tax returns for the 2012 and 2013 tax years. We are also under audit with respect to income taxes in many state and foreign jurisdictions. It is reasonably possible that certain of these income tax exam settled in 2019. We currently do not believe that the outcome of unresolved issues or claims will be material to our Consolidated Fin

At December 31, 2018 and 2017, net unrecognized tax benefits were $549 million and $554 million, respectively. Include December 31, 2018, were $452 million of tax positions that, if recognized, would impact the effective tax rate. The remaining l unrecognized tax benefits principally relates to tax positions where the ultimate recognition is highly certain but there is uncertainty such recognition. Because of the impact of deferred income tax accounting, the differences in recognition periods would not affect t tax rate but would accelerate the payment of cash to the taxing authority to an earlier period. As of December 31, 2018, we do not e changes to the estimated amount of unrecognized tax benefits in the next twelve months.

(19) Dividend restrictions – Insurance subsidiaries

Payments of dividends by our insurance subsidiaries are restricted by insurance statutes and regulations. Without prior regul principal insurance subsidiaries may declare up to approximately $16 billion as ordinary dividends during 2019.

Combined shareholders' equity of U.S. based insurance subsidiaries determined pursuant to statutory accounting rules (Su Policyholders) was approximately $162 billion at December 31, 2018 and $170 billion at December 31, 2017. Statutory surplus c corresponding amount based on GAAP due to differences in accounting for certain assets and liabilities. For instance, deferred cha assumed, deferred policy acquisition costs, unrealized gains on certain investments and related deferred income taxes are recognized for statutory reporting purposes. In addition, the carrying values of certain assets, such as goodwill and the carrying values of non- owned by our insurance subsidiaries, are not fully recognized for statutory reporting purposes.

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Notes to Consolidated Financial Statements *(Continued)*

(20) Fair value measurements

Our financial assets and liabilities are summarized below as of December 31, 2018 and December 31, 2017, with fair value to the fair value hierarchy (in millions). The carrying values of cash and cash equivalents, U.S. Treasury Bills, receivables and ac accruals and other liabilities are considered to be reasonable estimates of their fair values.

	Carrying Value	Fair Value	Quoted Prices (Level 1)	Significant Other Observable Inputs (Level 2)	U
December 31, 2018					
Investments in fixed maturity securities:					
U.S. Treasury, U.S. government corporations and agencies	$ 4,223	$ 4,223	$ 2,933	$ 1,290	
States, municipalities and political subdivisions	189	189	—	189	
Foreign governments	7,502	7,502	5,417	2,085	
Corporate bonds	7,440	7,440	—	7,434	
Mortgage-backed securities	544	544	—	544	
Investments in equity securities	172,757	172,757	172,253	203	
Investment in Kraft Heinz common stock	13,813	14,007	14,007	—	
Loans and finance receivables	16,280	16,377	—	1,531	
Derivative contract assets *(1)*	172	172	2	52	
Derivative contract liabilities:					
Railroad, utilities and energy *(1)*	111	111	1	101	
Equity index put options	2,452	2,452	—	—	
Notes payable and other borrowings:					
Insurance and other	34,975	35,361	—	35,335	
Railroad, utilities and energy	62,515	66,422	—	66,422	
December 31, 2017					
Investments in fixed maturity securities:					
U.S. Treasury, U.S. government corporations and agencies	$ 3,953	$ 3,953	$ 2,360	$ 1,593	
States, municipalities and political subdivisions	854	854	—	854	
Foreign governments	8,822	8,822	6,946	1,876	
Corporate bonds	6,862	6,862	—	6,856	
Mortgage-backed securities	862	862	—	862	
Investments in equity securities	170,540	170,540	170,494	46	
Investment in Kraft Heinz common stock	17,635	25,306	25,306	—	
Loans and finance receivables	13,748	14,136	—	17	
Derivative contract assets *(1)*	142	142	1	28	
Derivative contract liabilities:					
Railroad, utilities and energy *(1)*	82	82	3	69	
Equity index put options	2,172	2,172	—	—	
Notes payable and other borrowings:					

Insurance and other	40,409	41,762	—	41,757
Railroad, utilities and energy	62,178	70,538	—	70,538

(1) *Assets are included in other assets and liabilities are included in accounts payable, accruals and other liabilities.*

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(20) Fair value measurements *(Continued)*

The fair values of substantially all of our financial instruments were measured using market or income approaches. The measuring fair value consists of Levels 1 through 3, which are described below.

Level 1 – Inputs represent unadjusted quoted prices for identical assets or liabilities exchanged in active mar

Level 2 – Inputs include directly or indirectly observable inputs (other than Level 1 inputs) such as quoted prices for similar exchanged in active or inactive markets; quoted prices for identical assets or liabilities exchanged in inactive markets; other considered in fair value determinations of the assets or liabilities, such as interest rates and yield curves, volatilities, prepay severities, credit risks and default rates; and inputs that are derived principally from or corroborated by observable market or other means. Pricing evaluations generally reflect discounted expected future cash flows, which incorporate yield curve with similar characteristics, such as credit ratings, estimated durations and yields for other instruments of the issuer or en industry sector.

Level 3 – Inputs include unobservable inputs used in the measurement of assets and liabilities. Management is required assumptions regarding unobservable inputs because there is little, if any, market activity in the assets or liabilities and it r corroborate the related observable inputs. Unobservable inputs require management to make certain projections and assur information that would be used by market participants in valuing assets or liabilities.

Reconciliations of assets and liabilities measured and carried at fair value on a recurring basis with the use of significant un (Level 3) for each of the three years ending December 31, 2018 follow (in millions).

	Investments in equity and fixed maturity securities	Net derivative contract liabilities
Balance December 31, 2015	$ 21,503	$ (3,785)
Gains (losses) included in:		
Earnings	3,593	880
Other comprehensive income	872	(2)
Regulatory assets and liabilities	—	(11)
Acquisitions	10	—
Dispositions and settlements	(8,656)	(101)
Transfers into/out of Level 3	(1)	195
Balance December 31, 2016	17,321	(2,824)
Gains (losses) included in:		
Earnings	—	888
Other comprehensive income	1,157	(3)
Regulatory assets and liabilities	—	(1)
Dispositions and settlements	(59)	(129)
Transfers into/out of Level 3	(18,413)	—
Balance December 31, 2017	6	(2,069)
Gains (losses) included in:		
Earnings	—	(118)
Other comprehensive income	—	2
Regulatory assets and liabilities	—	3
Acquisitions	302	3
Dispositions and settlements	(1)	(164)
Balance December 31, 2018	$ 307	$ (2,343)

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(20) Fair value measurements *(Continued)*

Gains and losses included in earnings are reported as components of investment gains/losses, derivative gains/losses and c appropriate. In 2017 and 2016, gains and losses included in other comprehensive income were primarily the net change in unrealize investments and the reclassification of investment appreciation in net earnings in our Consolidated Statements of Comprehens

As disclosed in Note 4, we exercised our BAC Warrants to acquire BAC common stock on August 24, 2017. As payment of the BAC common stock, we surrendered substantially all of our BAC Preferred. Additionally, Restaurant Brands International Inc. (" 2017, redeemed a $3 billion private placement security that we acquired in 2014. Accordingly, during 2017, we concluded the Level previous fair value determinations of the BAC Warrants, BAC Preferred Stock and RBI investment were not significant and we t measurements from Level 3 to Level 2.

Quantitative information as of December 31, 2018, with respect to assets and liabilities measured and carried at fair value o with the use of significant unobservable inputs (Level 3) follows (in millions).

	Fair Value	Principal Valuation Techniques	Unobservable Inputs	Weighted Average
Derivative contract liabilities – Equity index put options	$ 2,452	Option pricing model	Volatility	18%

Our equity index put option contracts are illiquid and contain contract terms that are not standard in derivatives markets. Fo not required to post collateral under most of our contracts and certain of the contracts have relatively long durations. For these and classified these contracts as Level 3 measurements. The methods we use to value these contracts are those that we believe market par in determining exchange prices with respect to our contracts.

We value equity index put option contracts based on the Black-Scholes option valuation model. Inputs to this model incl contract duration and dividend and interest rate inputs (including a Berkshire non-performance input) which are observable. Howev the valuation of long-duration options using any model is inherently subjective and, given the lack of observable transactions and p values may be subject to wide ranges. Volatility inputs represent our expectations, which consider the remaining duration of each co that the contracts will remain outstanding until the expiration dates. Increases or decreases in the volatility inputs will produce increa the fair values of the liabilities.

(21) Common stock

Changes in Berkshire's issued, treasury and outstanding common stock during the three years ending December 31, 2018 are below. In addition to our common stock, 1,000,000 shares of preferred stock are authorized, but none are issued.

	Class A, $5 Par Value (1,650,000 shares authorized)			Class B, $0.0033 Par V (3,225,000,000 shares auth	
	Issued	Treasury	Outstanding	Issued	Treasury
Balance December 31, 2015	820,102	(11,680)	808,422	1,253,866,598	(1,409,762)
Conversions of Class A common stock to Class B common stock and exercises of replacement stock options issued in a business acquisition	(32,044)	—	(32,044)	49,457,329	—
Balance December 31, 2016	788,058	(11,680)	776,378	1,303,323,927	(1,409,762)
Conversions of Class A common stock to Class B common stock and exercises of replacement stock options issued in a business acquisition	(25,303)	—	(25,303)	38,742,822	—
Balance December 31, 2017	762,755	(11,680)	751,075	1,342,066,749	(1,409,762)
Conversions of Class A common stock to Class B common stock and exercises of replacement stock options issued in a business acquisition	(20,542)	—	(20,542)	31,492,234	—
Treasury stock acquired	—	(1,217)	(1,217)	—	(4,729,147)
Balance at December 31, 2018	742,213	(12,897)	729,316	1,373,558,983	(6,138,909)

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(21) Common stock *(Continued)*

Each Class A common share is entitled to one vote per share. Class B common stock possesses dividend and distributio one-fifteen-hundredth (1/1,500) of such rights of Class A common stock. Each Class B common share possesses voting rights one-ten-thousandth (1/10,000) of the voting rights of a Class A share. Unless otherwise required under Delaware General Corporatio Class B common shares vote as a single class. Each share of Class A common stock is convertible, at the option of the holder, into Class B common stock. Class B common stock is not convertible into Class A common stock. On an equivalent Class A common sto 1,640,929 shares outstanding as of December 31, 2018 and 1,644,846 shares outstanding as of December 31, 2017

Since we have two classes of common stock, we provide earnings per share data on the Consolidated Statements of Earn equivalent Class A shares outstanding and average equivalent Class B shares outstanding. Class B shares are economically e one-fifteen-hundredth (1/1,500) of a Class A share. Average equivalent Class A shares outstanding represents average Class A share one-fifteen-hundredth (1/1,500) of the average Class B shares outstanding. Average equivalent Class B shares outstanding represen shares outstanding plus 1,500 times average Class A shares outstanding.

For several years, Berkshire had a common stock repurchase program, which permitted Berkshire to repurchase its Class A at prices no higher than a 20% premium over the book value of the shares. On July 17, 2018, Berkshire's Board of Directors authori to the program, permitting Berkshire to repurchase shares any time that Warren Buffett, Berkshire's Chairman of the Board and Chie and Charlie Munger, Vice Chairman of the Board, believe that the repurchase price is below Berkshire's intrinsic value, conservative program continues to allow share repurchases in the open market or through privately negotiated transactions and does not specify a of shares to be repurchased. However, repurchases will not be made if they would reduce the total value of Berkshire's consolid equivalents and U.S. Treasury Bills holdings below $20 billion. The repurchase program does not obligate Berkshire to repurchase a amount or number of Class A or Class B shares and there is no expiration date to the program.

(22) Accumulated other comprehensive income

A summary of the net changes in after-tax accumulated other comprehensive income attributable to Berkshire Hathaway amounts reclassified out of accumulated other comprehensive income for each of the three years ending December 31, 2018 follo

	Unrealized appreciation of investments, net	Foreign currency translation	Prior service and actuarial gains/losses of defined benefit pension plans	Oth
Balance December 31, 2015	$ 38,598	$ (3,856)	$ (762)	$ 2
Other comprehensive income, net before reclassifications	9,011	(1,412)	94	(4
Reclassifications into net earnings:				
Earnings before income taxes	(6,820)	—	104	5
Applicable income taxes	2,387	—	(29)	(2
Balance December 31, 2016	43,176	(5,268)	(593)	(1
Other comprehensive income, net before reclassifications	19,826	2,151	65	1
Reclassifications into net earnings:				
Reclassifications before income taxes	(1,399)	3	155	1
Applicable income taxes	490	—	(47)	(
Balance December 31, 2017	62,093	(3,114)	(420)	1
Reclassifications to retained earnings upon adoption of new accounting standards	(61,340)	(65)	36	(
Other comprehensive income, net before reclassifications	(183)	(1,424)	(513)	2
Reclassifications into net earnings:				
Reclassifications before income taxes	(253)	—	116	3
Applicable income taxes	53	—	(35)	(
Balance December 31, 2018	$ 370	$ (4,603)	$ (816)	$

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(23) Revenues from contracts with customers

As discussed in Note 1(w), on January 1, 2018, we adopted ASC 606 "Revenues from Contracts with Customers." Except a
1, our revenue recognition practices for contracts with customers under ASC 606 do not differ significantly from prior practices. U
revenues are recognized when a good or service is transferred to a customer. A good or service is transferred when (or as) the custon
of that good or service. Revenues are based on the consideration we expect to receive in connection with our promises to deliver goo
our customers.

The following table summarizes customer contract revenues disaggregated by reportable segment and the source of the rev
ended December 31, 2018 (in millions). Other revenues included in our consolidated revenues were primarily insurance premiums
dividend and other investment income and leasing revenues which are not within the scope of ASC 606.

	Manufacturing	McLane Company	Service and Retail	BNSF	Berkshire Hathaway Energy	Insurance, Corporate and other	Total
Manufactured products:							
Industrial and commercial products	$ 25,707	$ —	$ 204	$ —	$ —	$ —	$ 25,911
Building products	14,323	—	—	—	—	—	14,323
Consumer products	14,790	—	—	—	—	—	14,790
Grocery and convenience store distribution	—	33,518	—	—	—	—	33,518
Food and beverage distribution	—	16,309	—	—	—	—	16,309
Auto sales	—	—	8,181	—	—	—	8,181
Other retail and wholesale distribution	2,091	—	12,067	—	—	—	14,158
Service	1,519	84	4,100	23,652	3,949	—	33,304
Electricity and natural gas	—	—	—	—	14,951	—	14,951
Total	58,430	49,911	24,552	23,652	18,900	—	175,445
Other revenue	3,340	76	4,297	51	1,070	63,558	72,392
	$ 61,770	$ 49,987	$ 28,849	$ 23,703	$ 19,970	$ 63,558	$ 247,837

A summary of the transaction price allocated to the significant unsatisfied remaining performance obligations relating to
expected durations in excess of one year as of December 31, 2018 follows (in millions).

	Performance obligations expected to be satisfied:		
	Less than 12 months	Greater than 12 months	Total
Electricity and natural gas	$ 842	$ 5,678	$ 6,520
Other sales and service contracts	1,190	1,904	3,094

(24) Pension plans

Several of our subsidiaries sponsor defined benefit pension plans covering certain employees. Benefits under the plans are
years of service and compensation, although benefits under certain plans are based on years of service and fixed benefit rates. Our
make contributions to the plans to meet regulatory requirements and may also make discretionary contributions. The components o
pension expense for each of the three years ending December 31, 2018 were as follows (in millions).

	2018	2017	2016
Service cost	$ 271	$ 273	$ 282
Interest cost	593	635	691
Expected return on plan assets	(988)	(939)	(908)
Amortization of actuarial losses and other	188	157	148
Net periodic pension expense	$ 64	$ 126	$ 213

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(24) Pension plans *(Continued)*

The accumulated benefit obligation is the actuarial present value of benefits earned based on service and compensation pri date. The projected benefit obligation ("PBO") is the actuarial present value of benefits earned based upon service and compensa valuation date and, if applicable, includes assumptions regarding future compensation levels. Benefit obligations under qualified U. pension plans are funded through assets held in trusts. Pension obligations under certain non-U.S. plans and non-qualified U.S. plans the aggregate PBOs of such plans were approximately $1.2 billion and $1.3 billion as of December 31, 2018 and 2017, resp

Reconciliations of the changes in plan assets and PBOs related to BHE's pension plans and all other pension plans for each ending December 31, 2018 are in the following tables (in millions). The costs of pension plans covering employees of certain regula BHE are generally recoverable through the regulated rate making process.

	2018			2017		
	BHE	All other	Consolidated	BHE	All other	Consolidated
Benefit obligations						
Accumulated benefit obligation end of year	$ 4,346	$ 11,540	$ 15,886	$ 4,920	$ 12,604	$ 17,524
PBO beginning of year	$ 5,207	$ 13,617	$ 18,824	$ 5,077	$ 12,673	$ 17,750
Service cost	40	231	271	47	226	273
Interest cost	161	432	593	174	461	635
Benefits paid	(208)	(633)	(841)	(271)	(626)	(897)
Settlements	(301)	(133)	(434)	(146)	(95)	(241)
Actuarial (gains) or losses and other	(348)	(1,143)	(1,491)	326	978	1,304
PBO end of year	$ 4,551	$ 12,371	$ 16,922	$ 5,207	$ 13,617	$ 18,824
Plan assets						
Plan assets beginning of year	$ 5,129	$ 11,885	$ 17,014	$ 4,694	$ 10,703	$ 15,397
Employer contributions	98	495	593	122	159	281
Benefits paid	(208)	(633)	(841)	(271)	(626)	(897)
Actual return on plan assets	(191)	(949)	(1,140)	535	1,601	2,136
Settlements	(324)	(132)	(456)	(159)	(76)	(235)
Other	(119)	(92)	(211)	208	124	332
Plan assets end of year	$ 4,385	$ 10,574	$ 14,959	$ 5,129	$ 11,885	$ 17,014
Funded status – net liability	$ 166	$ 1,797	$ 1,963	$ 78	$ 1,732	$ 1,810

The funded status of our defined benefit pension plans at December 31, 2018 reflected in assets was $510 million and in $2,473 million. At December 31, 2017, the funded status included in assets was $1,176 million and in liabilities was $2,98

Weighted average assumptions used in determining PBO and net periodic pension expense were as follow

	2018	2017	2016
Discount rate applicable to pension benefit obligations	3.9%	3.3%	3.8%
Expected long-term rate of return on plan assets	6.4	6.4	6.1
Rate of compensation increase	2.6	2.8	3.0
Discount rate applicable to net periodic pension expense	3.4	3.9	4.2

Benefits payments expected over the next ten years are as follows (in millions): 2019 – $1,017; 2020 – $986; 2021 – $988; – $1,001; and 2024 to 2028 – $5,027. Sponsoring subsidiaries expect to contribute $193 million to defined benefit pension pl

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(24) Pension plans *(Continued)*

Fair value measurements of plan assets as of December 31, 2018 and 2017 follow (in millions).

	Fair Value				Investment funds and partnerships at net asset value
	Total	Level 1	Level 2	Level 3	
December 31, 2018					
Cash and cash equivalents	$ 1,328	$ 1,197	$ 131	$ —	$ —
Equity securities	7,671	7,499	22	150	—
Government obligations	1,727	1,654	73	—	—
Other fixed maturity securities	836	172	631	33	—
Investment funds and other	3,397	170	1,042	273	1,912
	$ 14,959	$ 10,692	$ 1,899	$ 456	$ 1,912
December 31, 2017					
Cash and cash equivalents	$ 738	$ 594	$ 144	$ —	$ —
Equity securities	9,824	9,641	23	160	—
Government obligations	1,536	1,497	39	—	—
Other fixed maturity securities	799	148	619	32	—
Investment funds and other	4,117	150	1,501	274	2,192
	$ 17,014	$ 12,030	$ 2,326	$ 466	$ 2,192

Refer to Note 20 for a discussion of the three levels in the hierarchy of fair values. Plan assets are generally invested wit objective of producing earnings to adequately cover expected benefit obligations, while assuming a prudent level of risk. Allocation result of changing market conditions and investment opportunities. The expected rates of return on plan assets reflect subjective asses invested asset returns over a period of several years. Generally, past investment returns are not given significant consideration wh assumptions for expected long-term rates of return on plan assets. Actual experience will differ from the assumed rat

A reconciliation of the pre-tax accumulated other comprehensive income (loss) related to defined benefit pension plans fo years ending December 31, 2018 follows (in millions).

	2018	2017
Balance beginning of year	$ (614)	$ (839)
Amount included in net periodic pension expense	116	155
Actuarial gains (losses) and other	(686)	70
Balance end of year	$ (1,184)	$ (614)

Several of our subsidiaries also sponsor defined contribution retirement plans, such as 401(k) or profit sharing plans. Empl are subject to regulatory limitations and the specific plan provisions. Several plans provide for employer matching contributions up to the plans and provide for additional discretionary contributions as determined by management. Employer contributions expensed w defined contribution plans were $1,009 million in 2018, $1,001 million in 2017 and $912 million in 2016.

(25) Contingencies and Commitments

We are parties in a variety of legal actions that routinely arise out of the normal course of business, including legal actions s liability directly through insurance contracts or indirectly through reinsurance contracts issued by Berkshire subsidiaries. Plaintiffs punitive or exemplary damages. We do not believe that such normal and routine litigation will have a material effect on our financial of operations. Berkshire and certain of its subsidiaries are also involved in other kinds of legal actions, some of which assert or ma seek to impose fines and penalties. We believe that any liability that may arise as a result of other pending legal actions will not have our consolidated financial condition or results of operations.

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(25) Contingencies and Commitments *(Continued)*

We lease certain manufacturing, warehouse, retail and office facilities as well as certain equipment. Rent expense under op
$1,649 million in 2018, $1,579 million in 2017 and $1,573 million in 2016. Future minimum rental payments for operating le
non-cancellable terms in excess of one year are as follows (in millions).

2019	2020	2021	2022	2023	After 2023	Total
$1,360	$1,317	$1,098	$872	$708	$3,658	$9,013

Our subsidiaries regularly make commitments in the ordinary course of business to purchase goods and services used in th
most significant of these relate to our railroad, utilities and energy businesses and our fractional aircraft ownership business. As of D
estimated future payments under such arrangements were as follows: $15.7 billion in 2019, $4.5 billion in 2020, $3.7 billion in 20
2022, $2.9 billion in 2023 and $17.3 billion after 2023.

Pursuant to the terms of agreements with noncontrolling shareholders in our less than wholly-owned subsidiaries, we ma
acquire their equity interests. If we had acquired all outstanding noncontrolling interests as of December 31, 2018, we estimate the co
approximately $5.6 billion. However, the timing and the amount of any such future payments that might be required are contingent o
the noncontrolling owners.

(26) Business segment data

Our operating businesses include a large and diverse group of insurance, finance, manufacturing, service and retailing busi
our reportable business segments in a manner that reflects how management views those business activities. Certain businesses are g
segment reporting based upon similar products or product lines, marketing, selling and distribution characteristics, even though thos
operated under separate local management.

The accompanying business segment information for 2017 and 2016 reflects certain reclassifications to conform to prese
Specifically, business units that previously were reported as the finance and financial products segment were reclassified to manuf
Homes and UTLX), services and retailing (CORT and XTRA leasing) and corporate and other (principally investment in

The tabular information that follows shows data of reportable segments reconciled to amounts reflected in our Consoli
Statements. Intersegment transactions are not eliminated from segment results when management considers those transactions in ass
the respective segments. Furthermore, our management does not consider investment and derivative gains/losses, amortization of
accounting adjustments related to Berkshire's business acquisitions or certain other corporate income and expense items in assess
performance of operating units. Collectively, these items are included in reconciliations of segment amounts to consolidated

Business Identity	Business Activity
Insurance:	
GEICO	Underwriting private passenger automobile insurance mainly by direct response met
Berkshire Hathaway Reinsurance Group	Underwriting excess-of-loss, quota-share and facultative reinsurance worldwide
Berkshire Hathaway Primary Group	Underwriting multiple lines of property and casualty insurance policies for primarily commer
BNSF	Operation of one of the largest railroad systems in North America
Berkshire Hathaway Energy	Regulated electric and gas utility, including power generation and distribution activities and real activities
Manufacturing	Manufacturers of numerous products including industrial, consumer and building products, includi housing and related consumer financing
McLane Company	Wholesale distribution of groceries and non-food items
Service and retailing	Providers of numerous services including fractional aircraft ownership programs, aviation pilot tr components distribution, various retailing businesses, including automobile dealerships, and trailer a

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Notes to Consolidated Financial Statements *(Continued)*

(26) Business segment data *(Continued)*

A disaggregation of our consolidated data for each of the three most recent years is presented in the tables which follow

	Revenues			Earnings before income taxes		
	2018	2017	2016	2018	2017	2016
Operating Businesses:						
Insurance:						
Underwriting:						
GEICO	$ 33,363	$ 29,441	$ 25,483	$ 2,449	$ (310)	$ 462
Berkshire Hathaway Reinsurance Group	15,944	24,013	14,141	(1,109)	(3,648)	1,012
Berkshire Hathaway Primary Group	8,111	7,143	6,257	670	719	657
Insurance underwriting	57,418	60,597	45,881	2,010	(3,239)	2,131
Investment income	5,518	4,865	4,522	5,503	4,855	4,482
Total insurance	62,936	65,462	50,403	7,513	1,616	6,613
BNSF	23,855	21,387	19,829	6,863	6,328	5,693
Berkshire Hathaway Energy	19,987	18,854	17,764	2,472	2,499	2,878
Manufacturing	61,883	57,645	52,969	9,366	8,324	7,735
McLane Company	49,987	49,775	48,075	246	299	431
Service and retailing	28,939	27,219	26,392	2,696	2,304	2,058
	247,587	240,342	215,432	29,156	21,370	25,408
Reconciliation to consolidated amount:						
Investment and derivative gains/losses	—	—	—	(22,455)	2,128	8,304
Interest expense, not allocated to segments	—	—	—	(458)	(486)	(474)
Equity method investments	—	—	—	(2,167)	3,014	1,109
Corporate, eliminations and other	250	(409)	(318)	(75)	(2,188)	(680)
	$ 247,837	$ 239,933	$ 215,114	$ 4,001	$ 23,838	$ 33,667

	Interest expense			Income tax expense		
	2018	2017	2016	2018	2017	2016
Operating Businesses:						
Insurance	$ —	$ —	$ —	$ 1,374	$ (71)	$ 1,585
BNSF	1,041	1,016	992	1,644	2,369	2,124
Berkshire Hathaway Energy	1,777	2,254	1,715	(452)	148	371
Manufacturing	690	679	631	2,188	2,678	2,442
McLane Company	15	19	—	59	94	169
Service and retailing	91	67	71	634	812	761
	3,614	4,035	3,409	5,447	6,030	7,452
Reconciliation to consolidated amount:						
Investment and derivative gains/losses	—	—	—	(4,673)	742	1,807
Interest expense, not allocated to segments	458	486	474	(96)	(170)	(166)
Equity method investments	—	—	—	(753)	910	396
Income tax net benefit – Tax Cuts and Jobs Act of 2017	—	—	—	—	(28,200)	—
Corporate, eliminations and other	(219)	(135)	(142)	(246)	(827)	(249)
	$ 3,853	$ 4,386	$ 3,741	$ (321)	$ (21,515)	$ 9,240

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Notes to Consolidated Financial Statements *(Continued)*

(26) Business segment data *(Continued)*

	Capital expenditures			Depreciation of tangible assets		
	2018	2017	2016	2018	2017	2016
Operating Businesses:						
Insurance	$ 130	$ 170	$ 128	$ 79	$ 84	$ 85
BNSF	3,187	3,256	3,819	2,268	2,304	2,079
Berkshire Hathaway Energy	6,241	4,571	5,090	2,830	2,548	2,560
Manufacturing	3,116	2,490	2,581	1,890	1,839	1,757
McLane Company	276	289	258	204	193	165
Service and retailing	1,587	932	1,078	1,115	751	765
	$ 14,537	$ 11,708	$ 12,954	$ 8,386	$ 7,719	$ 7,411

	Goodwill at year-end			Identifiable assets at year-end		
	2018	2017	2016	2018	2017	2016
Operating Businesses:						
Insurance	$ 15,289	$ 15,499	$ 15,474	$ 289,746	$ 294,418	$ 234,037
BNSF	14,851	14,845	14,845	70,242	69,438	69,277
Berkshire Hathaway Energy	9,851	9,935	9,266	80,543	77,710	74,571
Manufacturing	34,019	33,967	32,915	99,912	97,753	93,835
McLane Company	734	734	734	6,243	6,090	5,896
Service and retailing	6,281	6,278	6,252	24,724	20,014	19,208
	$ 81,025	$ 81,258	$ 79,486	571,410	565,423	496,824
Reconciliation to consolidated amount:						
Corporate and other				55,359	55,414	44,544
Goodwill				81,025	81,258	79,486
				$ 707,794	$ 702,095	$ 620,854

Premiums written and earned by the property/casualty and life/health insurance businesses are summarized below (i

	Property/Casualty			Life/Health		
	2018	2017	2016	2018	2017	2016
Premiums Written:						
Direct	$ 44,513	$ 39,377	$ 34,001	$ 1,111	$ 866	$ 1,060
Assumed	8,970	17,815	8,037	5,540	4,925	4,672
Ceded	(869)	(694)	(798)	(49)	(47)	(62)
	$ 52,614	$ 56,498	$ 41,240	$ 6,602	$ 5,744	$ 5,670
Premiums Earned:						
Direct	$ 43,095	$ 37,755	$ 33,207	$ 1,111	$ 866	$ 1,060
Assumed	8,649	17,813	7,848	5,438	4,866	4,671
Ceded	(825)	(677)	(843)	(50)	(26)	(62)
	$ 50,919	$ 54,891	$ 40,212	$ 6,499	$ 5,706	$ 5,669

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(26) Business segment data *(Continued)*

Insurance premiums written by geographic region (based upon the domicile of the insured or reinsured) are summarized be millions.

	Property/Casualty			Life/Health		
	2018	2017	2016	2018	2017	2016
United States	$ 46,146	$ 50,604	$ 35,878	$ 3,598	$ 3,320	$ 3,473
Asia Pacific	3,726	3,307	3,616	1,361	879	715
Western Europe	2,157	1,516	1,406	939	909	822
All other	585	1,071	340	704	636	660
	$ 52,614	$ 56,498	$ 41,240	$ 6,602	$ 5,744	$ 5,670

Consolidated sales, service and leasing revenues were $139.1 billion in 2018, $132.8 billion in 2017 and $125.6 billion in 2 of such revenues were attributable to the United States compared to 85% in 2017 and 2016. The remainder of sales, service and leas primarily in Europe, Canada and the Asia Pacific. Consolidated sales, service and leasing revenues included sales to Walmart S approximately $13 billion in 2018 and $14 billion in 2017 and 2016. In 2018, approximately 96% of our revenues from railroad, ut businesses were in the United States compared to 95% in 2017 and 2016. At December 31, 2018, approximately 89% of our consoli plant and equipment and equipment held for lease was located in the United States with the remainder primarily in Canada a

(27) Quarterly data

A summary of revenues and net earnings by quarter for each of the last two years follows. This information is unaudited. millions, except per share amounts.

	1st Quarter	2nd Quarter	3rd Quarter
2018			
Revenues	$ 58,473	$ 62,200	$ 63,450
Net earnings (loss) attributable to Berkshire shareholders *	(1,138)	12,011	18,540
Net earnings (loss) attributable to Berkshire shareholders per equivalent Class A common share	(692)	7,301	11,280
2017			
Revenues	$ 64,370	$ 57,256	$ 59,507
Net earnings attributable to Berkshire shareholders *	4,060	4,262	4,067
Net earnings attributable to Berkshire shareholders per equivalent Class A common share	2,469	2,592	2,473

* *Includes after-tax investment and derivative gains/losses and a one-time income tax net benefit attributable to the enactment of the Act of 2017 as follows:*

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Investment and derivative gains/losses – 2018	$ (6,426)	$ 5,118	$ 11,660	$ (28,089)
Investment and derivative gains/losses – 2017	504	143	623	107
Income tax net benefit – Tax Cuts and Jobs Act of 2017	—	—	—	28,200

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None

Item 9A. Controls and Procedures

At the end of the period covered by this Annual Report on Form 10-K, the Corporation carried out an evaluation, under th with the participation of the Corporation's management, including the Chairman (Chief Executive Officer) and the Senior Vice P Financial Officer), of the effectiveness of the design and operation of the Corporation's disclosure controls and procedures pursuan Rule 13a-15. Based upon that evaluation, the Chairman (Chief Executive Officer) and the Senior Vice President (Chief Financial Off the Corporation's disclosure controls and procedures are effective in timely alerting them to material information relating to the Cor its consolidated subsidiaries) required to be included in the Corporation's periodic SEC filings. The report called for by Item 308(a) o incorporated herein by reference to Management's Report on Internal Control Over Financial Reporting, included on page K-61 o attestation report called for by Item 308(b) of Regulation S-K is incorporated herein by reference to Report of Independent Reg Accounting Firm, included on page K-62 of this report. There has been no change in the Corporation's internal control over financi the quarter ended December 31, 2018 that has materially affected, or is reasonably likely to materially affect, the Corporation's int financial reporting.

Item 9B. Other Information

None

Part III

Except for the information set forth under the caption "Executive Officers of the Registrant" in Part I hereof, information r (Items 10, 11, 12, 13 and 14) is incorporated by reference from the Registrant's definitive proxy statement, filed pursuant to Regul Annual Meeting of Shareholders of the Registrant to be held on May 4, 2019, which meeting will involve the election of d

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Part IV

Item 15. Exhibits and Financial Statement Schedules

(a)1. *Financial Statements*

The following Consolidated Financial Statements, as well as the Report of Independent Registered Public Accounting Fir
Part II Item 8 of this report:

2. *Financial Statement Schedule*

Other schedules are omitted because they are not required, information therein is not applicable, or is reflected in the Consolidated F
Statements or notes thereto.

(b) *Exhibits*

See the "Exhibit Index" at page K-113.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of
Berkshire Hathaway Inc.
Omaha, Nebraska

Opinion on the Financial Statement Schedule

We have audited the consolidated financial statements of Berkshire Hathaway Inc. and subsidiaries (the "Company") as of Decem
2017, and for each of the three years in the period ended December 31, 2018, and the Company's internal control over financial
December 31, 2018, and have issued our report thereon dated February 23, 2019; such consolidated financial statements and repo
elsewhere in this Form 10-K. Our audits also included the financial statement schedule of the Company listed in the Index at Item
statement schedule is the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's
schedule based on our audits. In our opinion, such financial statement schedule, when considered in relation to the financial statemen
presents fairly, in all material respects, the information set forth therein.

Change in Accounting Principle

As discussed in Note 1 to the financial statements of the Company, the Company has changed its method of accounting for invest
securities (excluding equity method investments) in 2018 due to the adoption of ASU 2016-01 "Financial Instruments – Recognition
of Financial Assets and Financial Liabilities."

/s/ Deloitte & Touche LLP

Omaha, Nebraska
February 23, 2019

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BERKSHIRE HATHAWAY INC.
(Parent Company)
Condensed Financial Information
(Dollars in millions)

Schedule I

Balance Sheets

	December 31, 2018	December 31, 2017
Assets:		
Cash and cash equivalents	$ 3,437	$ 4,039
Short-term investments in U.S. Treasury Bills	22,957	13,132
Investments in and advances to/from consolidated subsidiaries	328,898	335,668
Investment in The Kraft Heinz Company	13,813	17,635
Other assets	80	79
	$ 369,185	$ 370,553
Liabilities and Shareholders' Equity:		
Accounts payable, accrued interest and other liabilities	$ 1,507	$ 196
Income taxes, principally deferred	2,104	3,294
Notes payable and other borrowings	16,871	18,767
	20,482	22,257
Berkshire Hathaway shareholders' equity	348,703	348,296
	$ 369,185	$ 370,553

Statements of Earnings and Comprehensive Income

	Year ended December 31, 2018	2017	2016
Income items:			
From consolidated subsidiaries:			
Dividends	$ 9,658	$ 5,367	$ 9,862
Undistributed earnings (losses)	(3,952)	37,832	13,264
	5,706	43,199	23,126
Investment gains (losses)	(4)	(1)	700
Equity in net earnings (losses) of The Kraft Heinz Company	(2,730)	2,938	923
Other income	649	350	262
	3,621	46,486	25,011
Cost and expense items:			
General and administrative	216	159	80
Interest expense	601	522	452
Foreign exchange (gains) losses Euro-denominated senior notes	(366)	1,008	(244)
Income tax expense (benefit)	(851)	(143)	649
	(400)	1,546	937
Net earnings attributable to Berkshire Hathaway shareholders	4,021	44,940	24,074
Other comprehensive income attributable to Berkshire Hathaway shareholders	(2,211)	21,273	3,316
Comprehensive income attributable to Berkshire Hathaway shareholders	$ 1,810	$ 66,213	$ 27,390

See Note to Condensed Financial Information

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BERKSHIRE HATHAWAY INC.
(Parent Company)
Condensed Financial Information
(Dollars in millions)
Schedule I (continued)
Statements of Cash Flows

	Year ended December 31,		
	2018	2017	2016
Cash flows from operating activities:			
Net earnings attributable to Berkshire Hathaway shareholders	$ 4,021	$ 44,940	$ 24,074
Adjustments to reconcile net earnings to cash flows from operating activities:			
Investment gains (losses)	4	1	(700)
Undistributed earnings of consolidated subsidiaries	3,952	(37,832)	(13,264)
Income taxes payable	(972)	(135)	629
Other	3,062	(1,234)	(161)
Net cash flows from operating activities	10,067	5,740	10,578
Cash flows from investing activities:			
Redemption of Kraft Heinz Company preferred stock	—	—	8,320
Investments in and advances to/from consolidated subsidiaries, net	460	(239)	(26,398)
Purchases of U.S. Treasury Bills	(29,740)	(19,663)	(9,350)
Sales and maturities of U.S. Treasury Bills	21,442	14,847	1,145
Net cash flows from investing activities	(7,838)	(5,055)	(26,283)
Cash flows from financing activities:			
Proceeds from borrowings	17	1,201	9,278
Repayments of borrowings	(1,563)	(1,145)	(1,125)
Acquisition of treasury stock	(1,346)	—	—
Other	61	77	164
Net cash flows from financing activities	(2,831)	133	8,317
Increase (decrease) in cash and cash equivalents	(602)	818	(7,388)
Cash and cash equivalents at beginning of year	4,039	3,221	10,609
Cash and cash equivalents at end of year	$ 3,437	$ 4,039	$ 3,221
Other cash flow information:			
Income taxes paid	$ 2,790	$ 2,076	$ 3,583
Interest paid	388	386	307

Note to Condensed Financial Information

Berkshire acquired 50% of the outstanding common stock of Heinz Holding Company in 2013. After a series of transacti interest represented 26.8% of the outstanding common stock of The Kraft Heinz Company ("Kraft Heinz"). Berkshire currently ov outstanding shares of Kraft Heinz common stock. Reference is made to Note 5 to the Consolidated Financial Statements for additi concerning Berkshire's investment in Kraft Heinz.

Prior to 2018, the Parent Company issued Euro-denominated senior notes and the aggregate par amount outstanding of the €6.85 billion as of December 31, 2018 and 2017. The gains and losses from the periodic remeasurement of the Euro notes due to c currency exchange rates are included in earnings.

Parent Company debt maturities over the next five years are as follows: 2019—$752 million; 2020—$1,149 million; 2021 2022—$613 million and 2023—$3,991 million. Berkshire guarantees debt obligations of certain of its subsidiaries, which as of De totaled approximately $12.4 billion. Such guarantees are an absolute, unconditional and irrevocable guarantee for the full and prompt of all present and future payment obligations. Berkshire also provides guarantees in connection with equity index put option contr retroactive reinsurance contracts of subsidiaries. The amounts of subsidiary payments under these contracts, if any, is contingent up future events.

In December 2017, the Tax Cuts and Jobs Act of 2017 ("TCJA") was enacted, which reduced the Parent Company's incor 2017 by $550 million, primarily due to the reduction in deferred tax liabilities attributable to the lower U.S. statutory rate, partly of

income tax expense on certain accumulated undistributed earnings of foreign subsidiaries. The effects of the TCJA on income t
consolidated subsidiaries is included in undistributed earnings in consolidated subsidiaries.

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EXHIBIT INDEX

Exhibit No.	
2(i)	Agreement and Plan of Merger dated as of June 19, 1998 between Berkshire and General Re Corporatio Incorporated by reference to Annex I to Registration Statement No. 333-61129 filed on Form S-4.
2(ii)	Agreement and Plan of Merger dated as of November 2, 2009 by and among Berkshire, R Acquisition Company, LL Incorporated by reference to Annex A to Registration Statement No. 333-163343 on Form S-4.
2(iii)	Agreement and Plan of Merger dated August 8, 2015, by and among Berkshire, NW Merger Sub Inc. and Precision Cast (“PCC”) Incorporated by reference to Exhibit 2.1 to PCC’s Current Report on Form 8-K filed on August 10, 2015 (SEC File
3(i)	Restated Certificate of Incorporation Incorporated by reference to Exhibit 3(i) to Form 10-K filed on March 2, 2015.
3(ii)	By-Laws Incorporated by reference to Exhibit 3(ii) to Form 8-K filed on May 4, 2016.
4.1	Indenture, dated as of December 22, 2003, between Berkshire Hathaway Finance Corporation, Berkshire Hathaway Inc. New York Mellon Trust Company, N.A. (as successor to J.P. Morgan Trust Company, National Association), Incorporated by reference to Exhibit 4.1 on Form S-4 of Berkshire Hathaway Finance Corporation and Berkshire H on February 4, 2004. SEC File No. 333-112486
4.2	Indenture, dated as of February 1, 2010, among Berkshire Hathaway Inc., Berkshire Hathaway Finance Corporation and York Mellon Trust Company, N.A., as trustee. Incorporated by reference to Exhibit 4.1 to Berkshire’s Registration Statement on Form S-3 filed on February 1, No. 333-164611
4.3	Indenture, dated as of January 26, 2016, by and among Berkshire Hathaway Inc., Berkshire Hathaway Finance Corporatio New York Mellon Trust Company, N.A., as trustee. Incorporated by reference to Exhibit 4.1 to Berkshire’s Registration Statement on Form S-3 filed on January 26, No. 333-209122
4.4	Indenture, dated as of December 1, 1995, between BNSF and The First National Bank of Chicago, as trus Incorporated by reference to Exhibit 4 on Form S-3 of BNSF filed on February 8, 1999.
4.5	Indenture, dated as of October 4, 2002, by and between MidAmerican Energy Holdings Company and The Bank of Ne Incorporated by reference to Exhibit 4.1 to the Berkshire Hathaway Energy Company Registration Statement No. 3 December 6, 2002.
	Other instruments defining the rights of holders of long-term debt of Registrant and its subsidiaries are not being f amount of securities authorized by all other such instruments does not exceed 10% of the total assets of the Reg subsidiaries on a consolidated basis as of December 31, 2018. The Registrant hereby agrees to furnish to the Co request a copy of any such debt instrument to which it is a party.
10.1	Equity Commitment Letter of Berkshire Hathaway Inc. with Hawk Acquisition Holding Corporation dated Februa Incorporated by reference to Exhibit 10.1 on Form 8-K of Berkshire Hathaway Inc. filed on February 14
14	Code of Ethics Berkshire’s Code of Business Conduct and Ethics is posted on its Internet website at *www.berkshirehatha*
21	Subsidiaries of Registrant
23	Consent of Independent Registered Public Accounting Firm
31.1	Rule 13a—14(a)/15d-14(a) Certification
31.2	Rule 13a—14(a)/15d-14(a) Certification
32.1	Section 1350 Certification
32.2	Section 1350 Certification
95	Mine Safety Disclosures

101	The following financial information from Berkshire Hathaway Inc.'s Annual Report on Form 10-K for the year ended D formatted in XBRL (Extensible Business Reporting Language) includes: (i) the Consolidated Balance Sheets as of Dece 2017, (ii) the Consolidated Statements of Earnings for each of the three years ended December 31, 2018, 2017 and 2016, Statements of Comprehensive Income for each of the three years ended December 31, 2018, 2017 and 2016, (iv) the Statements of Changes in Shareholders' Equity for each of the three years ended December 31, 2018, 2017 and 2016, (v Statements of Cash Flows for each of the three years ended December 31, 2018, 2017 and 2016 and (vi) the Notes to Con Statements and Schedule I, tagged in summary and detail.

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SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly cause
signed on its behalf by the undersigned thereunto duly authorized.

BERKSHIRE HATHAWAY INC.

Date: February 23, 2019 /S/ MARC D. HAMBURG

Marc D. Hamburg
Senior Vice President and
Principal Financial Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following pe
the Registrant and in the capacities and on the dates indicated.

/S/ WARREN E. BUFFETT **Warren E. Buffett**	Chairman of the Board of Directors—Chief Executive Officer	February 23, 2019 Date
/S/ GREGORY E. ABEL **Gregory E. Abel**	Director—Vice Chairman—Non Insurance Operations	February 23, 2019 Date
/S/ HOWARD G. BUFFETT **Howard G. Buffett**	Director	February 23, 2019 Date
/S/ STEPHEN B. BURKE **Stephen B. Burke**	Director	February 23, 2019 Date
/S/ SUSAN L. DECKER **Susan L. Decker**	Director	February 23, 2019 Date
/S/ WILLIAM H. GATES III **William H. Gates III**	Director	February 23, 2019 Date
/S/ DAVID S. GOTTESMAN **David S. Gottesman**	Director	February 23, 2019 Date
/S/ CHARLOTTE GUYMAN **Charlotte Guyman**	Director	February 23, 2019 Date
/S/ AJIT JAIN **Ajit Jain**	Director—Vice Chairman—Insurance Operations	February 23, 2019 Date
/S/ CHARLES T. MUNGER **Charles T. Munger**	Director—Vice Chairman	February 23, 2019 Date
/S/ THOMAS S. MURPHY **Thomas S. Murphy**	Director	February 23, 2019 Date
/S/ RONALD L. OLSON **Ronald L. Olson**	Director	February 23, 2019 Date
/S/ WALTER SCOTT, JR. **Walter Scott, Jr.**	Director	February 23, 2019 Date
/S/ MERYL B. WITMER **Meryl B. Witmer**	Director	February 23, 2019 Date
/S/ MARC D. HAMBURG **Marc D. Hamburg**	Senior Vice President—Principal Financial Officer	February 23, 2019 Date
/S/ DANIEL J. JAKSICH **Daniel J. Jaksich**	Vice President—Principal Accounting Officer	February 23, 2019 Date

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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT

For the fiscal year ended December 31, 2017
Commission file number 001-14905

BERKSHIRE HATHAWAY INC.
(Exact name of Registrant as specified in its charter)

Delaware	**47-0813844**
State or other jurisdiction of incorporation or organization	**(I.R.S. Employer Identification Number)**
3555 Farnam Street, Omaha, Nebraska	**68131**
(Address of principal executive office)	**(Zip Code)**

Registrant's telephone number, including area code (402) 346-1400
Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
Class A common stock, $5.00 Par Value	New York Stock Exchange
Class B common stock, $0.0033 Par Value	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: NONE

Indicate by check mark if the Registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes

Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes

Indicate by check mark whether the Registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Ex during the preceding 12 months, and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ N

Indicate by check mark whether the Registrant has submitted electronically and posted on its corporate Website, if any, every Inter required to be submitted and posted pursuant to Rule 405 of Regulations S-T during the preceding 12 months. Yes ☑

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will no the best of Registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this For amendment to this Form 10-K. ☐

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporti emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "e company" in Rule 12b-2 of the Exchange Act.: Large accelerated filer ☑ Accelerated filer ☐ Non-accelerated filer ☐ Smaller repo Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for co new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐

State the aggregate market value of the voting stock held by non-affiliates of the Registrant as of June 30, 2017: $327,898,

Indicate number of shares outstanding of each of the Registrant's classes of common stock:

February 13, 2018—Class A common stock, $5 par value	748,745 shares
February 13, 2018—Class B common stock, $0.0033 par value	1,344,332,039 shares

DOCUMENTS INCORPORATED BY REFERENCE

Document	Incorporated In
Proxy Statement for Registrant's Annual Meeting to be held May 5, 2018	Part III

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* This aggregate value is computed at the last sale price of the common stock on June 30, 2017. It does not include the value of Clas (312,306 shares) and Class B common stock (64,664,309 shares) held by Directors and Executive Officers of the Registrant and immediate families, some of whom may not constitute "affiliates" for purpose of the Securities Exchange Act of 1

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Part I

Item 1. Business Description

Berkshire Hathaway Inc. ("Berkshire," "Company" or "Registrant") is a holding company owning subsidiaries engaged in a business activities. The most important of these are insurance businesses conducted on both a primary basis and a reinsurance bas transportation business and a group of utility and energy generation and distribution businesses. Berkshire also owns and operates other businesses engaged in a variety of activities, as identified herein. Berkshire is domiciled in the state of Delaware, and its corp are located in Omaha, Nebraska.

Berkshire's operating businesses are managed on an unusually decentralized basis. There are essentially no centralized or in functions (such as sales, marketing, purchasing, legal or human resources) and there is minimal involvement by Berkshire's corpora the day-to-day business activities of the operating businesses. Berkshire's corporate senior management team participates in and responsible for significant capital allocation decisions, investment activities and the selection of the Chief Executive to head each businesses. It also is responsible for establishing and monitoring Berkshire's corporate governance practices, including, but no communicating the appropriate "tone at the top" messages to its employees and associates, monitoring governance efforts, includ operating businesses, and participating in the resolution of governance-related issues as needed.

Berkshire and its consolidated subsidiaries employ approximately 377,000 people worldwide.

Insurance and Reinsurance Businesses

Berkshire's insurance and reinsurance business activities are conducted through numerous domestic and foreign-based ins Berkshire's insurance businesses provide insurance and reinsurance of property and casualty risks and also reinsure life, accident worldwide.

In direct or primary insurance activities, the insurer assumes the risk of loss from persons or organizations that are directly s Such risks may relate to property, casualty (or liability), life, accident, health, financial or other perils that may arise from an insu reinsurance activities, the reinsurer assumes defined portions of risks that other direct insurers or reinsurers have assumed in thei activities.

Reinsurance contracts are normally classified as treaty or facultative contracts. Treaty reinsurance refers to reinsurance cov portion of a specified group or class of risks ceded by the direct insurer, while facultative reinsurance involves coverage of spec underlying risks. Reinsurance contracts are further classified as quota-share or excess. Under quota-share (proportional or pro-rata reinsurer shares proportionally in the original premiums and losses of the direct insurer or reinsurer. Excess (or non-proportional) re for the indemnification of the direct insurer or reinsurer for all or a portion of the loss in excess of an agreed upon amount or "reten share and excess reinsurance contracts may provide for aggregate limits of indemnification.

Insurance and reinsurance are generally subject to regulatory oversight throughout the world. Except for regulatory conside virtually no barriers to entry into the insurance and reinsurance industry. Competitors may be domestic or foreign, as well as licensed number of competitors within the industry is not known. Insurers and reinsurers compete on the basis of reliability, financial stren financial ratings, underwriting consistency, service, business ethics, price, performance, capacity, policy terms and coverage

Insurers based in the United States ("U.S.") are subject to regulation by their states of domicile and by those states in which t write policies on an admitted basis. The primary focus of regulation is to assure that insurers are financially solvent and that policyh otherwise protected. States establish minimum capital levels for insurance companies and establish guidelines for permissible busin activities. States have the authority to suspend or revoke a company's authority to do business as conditions warrant. States regula dividends by insurance companies to their shareholders and other transactions with affiliates. Dividends, capital distributions and ot extraordinary amounts are subject to prior regulatory approval.

Insurers may market, sell and service insurance policies in the states where they are licensed. These insurers are referred to as Admitted insurers are generally required to obtain regulatory approval of their policy forms and premium rates. Non-admitted insura developed to provide insurance that is otherwise unavailable through admitted insurers. Non-admitted insurance, often referred to surplus" lines, is procured by either state-licensed surplus lines brokers who place risks with insurers not licensed in that state or by direct procurement from non-admitted insurers. Non-admitted insurance is subject to considerably less regulation with respect to poli Reinsurers are normally not required to obtain regulatory approval of premium rates or reinsurance contracts.

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The insurance regulators of every state participate in the National Association of Insurance Commissioners ("NAIC"). The N
instructions and accounting procedures for use by U.S. insurers and reinsurers in preparing and filing annual statutory financial staten
insurer's state of domicile has ultimate authority over these matters. In addition to its activities relating to the annual statement, the
adopts statutory accounting principles, model laws, regulations and programs for use by its members. Such matters deal with regula
solvency, risk management, compliance with financial regulation standards and risk-based capital reporting requireme

Berkshire's insurance companies maintain capital strength at exceptionally high levels, which differentiates them from th
Collectively, the combined statutory surplus of Berkshire's U.S. based insurers was approximately $170 billion at December 31, 2017
insurance subsidiaries are rated AA+ by Standard & Poor's and A++ (superior) by A.M. Best with respect to their financial condition
ability.

The Terrorism Risk Insurance Act of 2002 established within the Department of the Treasury a Terrorism Insurance Progran
commercial property and casualty insurers by providing federal reinsurance of insured terrorism losses. The Program currently exten
2020 through other Acts, most recently the Terrorism Risk Insurance Program Reauthorization Act of 2015 (the "2015 TRIA Rea
Hereinafter these Acts are collectively referred to as TRIA. Under TRIA, the Department of the Treasury is charged with certifying "
During 2018, coverage under TRIA will occur if the industry insured loss for certified events occurring during the calendar year exc
Under the 2015 TRIA Reauthorization, the level of insured losses for certified events occurring during the calendar year required to
under TRIA will increase annually by $20 million per year until the level of insured losses required to trigger coverage reaches $200
be eligible for federal reinsurance, insurers must make available insurance coverage for acts of terrorism, by providing policyholde
conspicuous notice of the amount of premium that will be charged for this coverage and of the federal share of any insured losses res
of terrorism. Assumed reinsurance is specifically excluded from TRIA participation. TRIA currently also excludes certain forms of
(such as personal and commercial auto, burglary, theft, surety and certain professional liability lines). Reinsurers are not required t
coverage and are not eligible for federal reinsurance of terrorism losses.

During 2018, in the event of a certified act of terrorism, the federal government will reimburse insurers (conditioned on the
policyholder notification requirements) for 82% of their insured losses in excess of an insurance group's deductible. Under the
Reauthorization, the federal government's reimbursement obligation will be reduced annually by 1% per year until the level of re
reduced to 80% in 2020. Under the Program, the deductible is 20% of the aggregate direct subject earned premium for relevant co
business in the immediately preceding calendar year. The aggregate deductible in 2018 for Berkshire's insurance group is expected
$1.1 billion. There is also an aggregate limit of $100 billion on the amount of the federal government coverage for each T

Regulation of the insurance industry outside of the United States is subject to the laws and regulations of each country in wh
operations or writes premiums. Some jurisdictions impose comprehensive regulatory requirements on insurance businesses, such
Kingdom, where insurers are subject to regulation by the Prudential Regulation Authority and the Financial Conduct Authority and
insurers are subject to regulation by the Federal Financial Supervisory Authority (BaFin). Other jurisdictions may impose fewer requ
foreign countries, reinsurers are also required to be licensed by governmental authorities. These licenses may be subject to modifica
revocation dependent on such factors as amount and types of insurance liabilities and minimum capital and solvency tests. The viola
requirements may result in fines, censures and/or criminal sanctions in various jurisdictions.

Berkshire's insurance underwriting operations include the following groups: (1) GEICO, (2) Berkshire Hathaway Reinsur
(3) Berkshire Hathaway Primary Group. Except for retroactive reinsurance and periodic payment annuity products that generate sign
up-front premiums along with estimated claims expected to be paid over very long periods of time (creating "float," see Investmen
Berkshire expects to achieve a net underwriting profit over time and to reject inadequately priced risks. Underwriting profit is de
premiums less associated incurred losses, loss adjustment expenses and underwriting and policy acquisition expenses. Underwritin
include investment income earned from investments. Berkshire's insurance businesses employ approximately 47,000 people. Addit
related to each of Berkshire's underwriting groups follows.

GEICO—GEICO is headquartered in Chevy Chase, Maryland and its insurance subsidiaries consist of: Government Emp
Company, GEICO General Insurance Company, GEICO Indemnity Company, GEICO Casualty Company, GEICO Advantage Insu
GEICO Choice Insurance Company, GEICO Secure Insurance Company, GEICO County Mutual Insurance Company and GEICO
Company. These companies primarily offer private passenger automobile insurance to individuals in all 50 states and the District
addition, GEICO insures motorcycles, all-terrain vehicles, recreational vehicles, boats and small commercial fleets and acts as an age
who offer homeowners, renters, boat, life and identity

management insurance to individuals who desire insurance coverages other than those offered by GEICO. GEICO markets its policie direct response methods in which applications for insurance are submitted directly to the companies via the Internet or by t

The automobile insurance business is highly competitive in the areas of price and service. Some insurance companies may competition by selling their products for a period of time at less than adequate rates. GEICO will not knowingly follow that strategy for private passenger automobile insurance customers in the preferred, standard and non-standard risk markets with other companies the customer as well as with companies that use agency sales forces, including State Farm, Allstate (including Esurance), Progressiv result of an aggressive advertising campaign and competitive rates, voluntary policies-in-force have increased about 41% over the According to most recently published A.M. Best data for 2016, the five largest automobile insurers had a combined market sha approximately 55%, with GEICO's market share being second largest at approximately 11.9%. Since the publication of that data, ma that GEICO's current market share has grown to approximately 12.8%. Seasonal variations in GEICO's insurance business are not si extraordinary weather conditions or other factors may have a significant effect upon the frequency or severity of automobil

Private passenger auto insurance is strictly regulated by state insurance departments. As a result, it is difficult for insuranc differentiate their products. Competition for private passenger automobile insurance, which is substantial, tends to focus on price an service provided. GEICO's cost-efficient direct response marketing methods and emphasis on customer satisfaction enable it to offe and value to its customers. GEICO primarily uses its own claims staff to manage and settle claims. The name and reputation of GE asset and management protects it and other service marks through appropriate registrations.

Berkshire Hathaway Reinsurance Group—Berkshire's combined global reinsurance business, referred to as the Berks Reinsurance Group ("BHRG"), offers a wide range of coverages on property, casualty, life and health risks to insurers and reinsu Reinsurance business is written through National Indemnity Company ("NICO"), domiciled in Nebraska, its subsidiaries and vario subsidiaries wholly owned by Berkshire (collectively, the "NICO Group") and General Reinsurance Corporation ("GRC"), domicile its subsidiaries (collectively the "General Re Group"). BHRG's underwriting operations in the U.S. are headquartered in Stamford, also conducts business activities globally in 23 countries.

The type and volume of business written is dependent on market conditions, including prevailing premium rates and covera of underwriting activities often fluctuates significantly from year to year depending on the perceived level of price adequacy in spe reinsurance markets as well as from the timing of particularly large reinsurance transactions.

Property/casualty

The NICO Group offers traditional property/casualty reinsurance on both an excess-of-loss and a quota-share basis, catastro treaty and facultative reinsurance, and primary insurance on an excess-of-loss basis for large or unusual risks for clients worldwide. periodically participates in underwriting placements with major brokers in the London Market through Berkshire Hathaway Insura Ltd., based in Great Britain. Business is written through intermediary brokers or directly with the insured or reinsured. NICO also o retroactive reinsurance contracts, which cover past loss events arising from property and casualty contracts written by ceding insur

The type and volume of business written by the NICO Group may vary significantly from period to period resulting from ch premium rate adequacy and from unique or large transactions. A significant portion of NICO Group's annual reinsurance premium derives from a 10-year, 20% quota-share agreement with Insurance Australia Group Limited ("IAG") that became effective July 1, 2 line insurer in Australia, New Zealand and other Asia Pacific countries.

The General Re Group conducts a global property and casualty reinsurance business. Contracts are written on both a quota basis for multiple lines of business. Contracts are primarily in the form of treaties, and to a lesser degree, on a facultativ

General Re Group's business in North America is primarily conducted through GRC, which is licensed in the District of Colu except Hawaii, where it is an accredited reinsurer. Operations in North America are conducted from its headquarters in Stamford, through 13 branch offices in the U.S. and Canada. Reinsurance activities are primarily marketed directly to clients without invol intermediary.

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In North America, the General Re Group also includes General Star National Insurance Company, General Star Indemnity Co Insurance Company, which underwrite a broad array of specialty and surplus lines and property, casualty and professional liability c select group of wholesale brokers, manage general underwriters and program administrators, and offer solutions for the unique need commercial and captive customers.

General Re Group's international reinsurance business is conducted on a direct basis through General Reinsurance AG ("GR several other subsidiaries and branches in 17 countries. International business is also written through brokers, primarily via Faraday subsidiary. Faraday owns the managing agent of Syndicate 435 at Lloyd's and provides capacity and participates in 100% of the re 435.

Retroactive reinsurance

Retroactive reinsurance contracts indemnify ceding companies against the adverse development of claims arising from loss already occurred under property and casualty policies issued in prior years. Coverages under such contracts are provided on an exc stated retention) or for losses payable immediately after the inception of the contract. Contracts are normally subject to aggreg indemnification and are occasionally exceptionally large in amount. Significant amounts of asbestos, environmental and latent injur under these contracts.

For instance, in January 2017, NICO entered into a retroactive reinsurance agreement with various subsidiaries of American I Inc. (collectively, "AIG"). Under the agreement, NICO agreed to indemnify AIG for 80% of up to $25 billion in excess of $25 billio of losses and allocated loss adjustment expenses with respect to certain commercial insurance loss events occurring in years p

In 2014, NICO entered into a reinsurance contract with Liberty Mutual Insurance Company ("LMIC"). Under the agreemen substantially all of LMIC's unpaid losses and allocated loss adjustment expense liabilities related to (a) asbestos and environmental c incepting prior to January 1, 2005, and (b) workers' compensation claims occurrences arising prior to January 1, 2014, subject to an of approximately $12.5 billion and subject to an aggregate limit of $6.5 billion.

The concept of time-value-of-money is an important element in establishing retroactive reinsurance contract prices and terms of losses are often expected to occur over decades. Expected ultimate losses payable under these policies are normally expected to thus producing underwriting losses. This business is accepted, in part, because of the large amounts of policyholder funds generated economic benefit of which will be reflected through investment results in future periods.

Life/health

The General Re Group also conducts a global life and health reinsurance business. In the U.S. and internationally, the Gener life, disability, supplemental health, critical illness and long-term care coverages. The life/health business is marketed on a direct approximately 33% of life/health net premiums were written in the United States, 23% in Western Europe and the remaining 44% th the world.

Additionally, Berkshire Hathaway Life Insurance Company of Nebraska ("BHLN"), a subsidiary of NICO, writes reinsuranc forms of traditional life insurance exposures. BHLN and its affiliates have also periodically reinsured certain guaranteed minimum similar benefit coverages on closed-blocks of variable annuity reinsurance contracts.

Periodic payment annuity

BHLN writes periodic payment annuity insurance policies and reinsures existing annuity-like obligations. Under these polici upfront premiums and agrees in the future to make periodic payments that often extend for decades. These policies, generally relate underlying personal injury or workers' compensation cases of other insurers, and are known as structured settlements. Similar to retr contracts, time-value-of-money concepts are an important factor in establishing such premiums and underwriting losses are expecte accretion of time-value discounted liabilities.

Berkshire Hathaway Primary Group—The Berkshire Hathaway Primary Group ("BH Primary") is a collection of indepe primary insurers that provide a wide variety of insurance coverages to policyholders located principally in the United States. These are discussed below.

NICO and certain affiliates ("NICO Primary") underwrite motor vehicle and general liability insurance to commercial ente admitted and excess and surplus basis. This business is written nationwide primarily through insurance agents and brokers and is Nebraska.

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The “Berkshire Hathaway Homestate Companies” (“BHHC”) is a group of insurers offering workers’ compensation, comm commercial property coverages. BHHC has developed a national reach, with the ability to provide first-dollar and small to large de compensation coverage to employers in all states, except those where coverage is available only through state-operated workers’ co BHHC serves a diverse client base. The BHHC business is generated primarily through independent agents and brok

Berkshire Hathaway Specialty Insurance (“BH Specialty”) was formed in April 2013. BH Specialty provides primary and e property, casualty, healthcare professional liability, executive and professional lines, surety and travel insurance and other insuranc writes business on both an excess and surplus lines basis and an admitted basis in the U.S., and on a locally admitted basis outside th is based in Boston, Massachusetts, with regional offices currently in several cities in the U.S. and international offices in Australia, N Kong, Singapore, Canada, Germany, United Kingdom and Macau. BH Specialty currently intends to further expand its operations. B business through wholesale and retail insurance brokers, as well as managing general agents.

MedPro Group (“MedPro”) is a national leader in offering customized healthcare liability insurance, claims, patient safety a physicians, surgeons, dentists and other healthcare professionals, as well as hospitals, senior care and other healthcare facilities. Me insurance coverage to protect healthcare providers against losses since 1899. Its insurance policies are distributed primarily throu network of appointed agents and brokers. MedPro recently began offering coverage options to healthcare providers in the United Ki Singapore, as well as insurance and reinsurance options related to student health insurance programs.

U.S. Investment Corporation (“USIC”) and its subsidiaries are specialty insurers that underwrite commercial, professional a insurance on an admitted and excess and surplus basis. Policies are marketed in all 50 states and the District of Columbia through w insurance agents. USIC companies also underwrite and market a wide variety of specialty insurance products.

Applied Underwriters, Inc. (“Applied”) is a provider of payroll and insurance services to small and mid-sized employers. A subsidiaries principally markets a product that bundles workers’ compensation and other employment related insurance coverages an into a seamless package that is designed to remove the burden of administrative and regulatory requirements faced by small to mid

The Berkshire Hathaway GUARD Insurance Companies provide commercial property and casualty insurance coverage to sm businesses and are based in Wilkes-Barre, Pennsylvania. Policies are offered through independent agents. Central States Indemnity C based in Omaha, Nebraska, primarily writes Medicare Supplement insurance and credit insurance.

Investments of insurance businesses—Berkshire’s insurance subsidiaries hold significant levels of invested assets. Investe shareholder capital as well as funds provided from policyholders through insurance and reinsurance business (“float”). Float is the a of net policyholder funds generated through underwriting activities that is available for investment. The major components of float a loss adjustment expenses, life, annuity and health benefit liabilities, unearned premiums and other policyholder liabilities less premi receivables, deferred policy acquisition costs and deferred charges on reinsurance contracts. On a consolidated basis, float has approximately $70 billion at the end of 2011 to approximately $114 billion at the end of 2017, primarily through internal growth. F 2016, Berkshire’s cost of float was negative, as its insurance businesses produced net underwriting gains. The cost of average float 3% in 2017, primarily attributable to sizable catastrophe losses and foreign currency exchange rate losses relating to non-U.S. Do reinsurance liabilities.

Investments of insurance subsidiaries include a very large portfolio of publicly-traded equity securities, which are concentrat issuers, as well as fixed maturity securities and cash and short-term investments. Investment portfolios are primarily managed by Be senior management group. Generally, there are no targeted allocations by investment type or attempts to match investment asset and durations. However, investment portfolios have historically included a much greater proportion of equity securities than is customa industry.

Railroad Business—Burlington Northern Santa Fe

Burlington Northern Santa Fe, LLC (“BNSF”) is based in Fort Worth, Texas, and through BNSF Railway Company operate railroad systems in North America. BNSF had approximately 41,000 employees at the end of 2017.

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In serving the Midwest, Pacific Northwest, Western, Southwestern and Southeastern regions and ports of the United States, I range of products and commodities derived from manufacturing, agricultural and natural resource industries. Over half of freight rev by contractual agreements of varying durations, while the balance is subject to common carrier published prices or quotations offered financial performance is influenced by, among other things, general and industry economic conditions at the international, national a BNSF's primary routes, including trackage rights, allow it to access major cities and ports in the western and southern United States Canada and Mexico. In addition to major cities and ports, BNSF efficiently serves many smaller markets by working closely with a shortline railroads. BNSF has also entered into marketing agreements with other rail carriers, expanding the marketing reach for each customers. For the year ending December 31, 2017, approximately 35% of freight revenues were derived from consumer products, 2 products, 21% from agricultural products and 19% from coal.

Regulatory Matters

BNSF is subject to federal, state and local laws and regulations generally applicable to all of its businesses. Rail operations regulatory jurisdiction of the Surface Transportation Board ("STB") of the United States Department of Transportation ("DOT"), th Administration of the DOT, the Occupational Safety and Health Administration ("OSHA"), as well as other federal and state regula Canadian regulatory agencies for operations in Canada. The STB has jurisdiction over disputes and complaints involving certain r services, the sale or abandonment of rail lines, applications for line extensions and construction, and the merger with or acquisition common carriers. The outcome of STB proceedings can affect the profitability of BNSF's business.

The DOT and OSHA have jurisdiction under several federal statutes over a number of safety and health aspects of rail operat transportation of hazardous materials. State agencies regulate some aspects of rail operations with respect to health and safety in ar preempted by federal law. BNSF Railway is required to transport these materials to the extent of its common carrier obli

Environmental Matters

BNSF's rail operations, as well as those of its competitors, are also subject to extensive federal, state and local environme covering discharges to water, air emissions, toxic substances and the generation, handling, storage, transportation and disposal of wa materials. Such regulations effectively increase the costs and liabilities associated with rail operations. Environmental risks are als operations, which frequently involve transporting chemicals and other hazardous materials.

Many of BNSF's land holdings are or were used for industrial or transportation-related purposes or leased to commercial or in whose activities may have resulted in discharges onto the property. As a result, BNSF is subject to, and will from time to time contin environmental cleanup and enforcement actions. In particular, the federal Comprehensive Environmental Response, Compensation ("CERCLA"), also known as the Superfund law, generally imposes joint and several liabilities for the cleanup and enforcement cos former owners and operators of a site, without regard to fault or the legality of the original conduct. Accordingly, BNSF may be re CERCLA and other federal and state statutes for all or part of the costs to clean up sites at which certain substances may have been r its current lessees, former owners or lessees of properties, or other third parties. BNSF may also be subject to claims by third parties cleanup, restoration or other environmental costs under environmental statutes or common law with respect to properties they own impacted by BNSF operations.

Competition

The business environment in which BNSF operates is highly competitive. Depending on the specific market, deregulated m other railroads, as well as river barges, ships and pipelines in certain markets, may exert pressure on price and service levels. The pre high service truck lines with expedited delivery, subsidized infrastructure and minimal empty mileage continues to affect the market sensitive freight. The potential expansion of longer combination vehicles could further encroach upon markets traditionally served by to remain competitive, BNSF and other railroads seek to develop and implement operating efficiencies to improve produ

As railroads streamline, rationalize and otherwise enhance their franchises, competition among rail carriers intensifies. BN competitor in the Western region of the United States is the Union Pacific Railroad Company. Other Class I railroads and numerous and motor carriers also operate in parts of the same territories served by BNSF. Based on weekly reporting by the Association of Ar BNSF's share of the western United States rail traffic in 2017 was approximately 50.9%.

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Utilities and Energy Businesses—Berkshire Hathaway Energy

Berkshire currently owns 90.2% of the outstanding common stock of Berkshire Hathaway Energy Company ("BHE"). BHE company with subsidiaries that generate, transmit, store, distribute and supply energy. BHE's locally managed businesses are orga operating units. BHE's domestic regulated energy interests are comprised of four regulated utility companies serving approximately customers, two interstate natural gas pipeline companies with approximately 16,400 miles of pipeline and a design capacity of appro cubic feet of natural gas per day and ownership interests in electricity transmission businesses. BHE's Great Britain electricity distri serve about 3.9 million electricity end-users and its electricity transmission-only business in Alberta, Canada serves approximately Canada's population. BHE's interests also include a diversified portfolio of independent power projects, the second-largest reside brokerage firm in the United States, and one of the largest residential real estate brokerage franchise networks in the United State approximately 23,000 people in connection with its various operations.

General Matters

PacifiCorp is a regulated electric utility company headquartered in Oregon, serving electric customers in portions of Utah, C Washington, Idaho and California. The combined service territory's diverse regional economy ranges from rural, agricultural and mi manufacturing and government service centers. No single segment of the economy dominates the combined service territory, whic PacifiCorp's exposure to economic fluctuations. In addition to retail sales (electricity sold to end-use customers), PacifiCorp sells wholesale basis to other electricity retailers and wholesalers.

MidAmerican Energy Company ("MEC") is a regulated electric and natural gas utility company headquartered in Iowa, se natural gas customers primarily in Iowa and also in portions of Illinois, South Dakota and Nebraska. MEC has a diverse retail custo of urban and rural residential customers and a variety of commercial and industrial customers. In addition to retail sales and natural MEC sells electricity principally to markets operated by regional transmission organizations and natural gas on a wholesa

NV Energy, Inc. ("NV Energy"), acquired by BHE on December 19, 2013, is an energy holding company headquartered in consisting of two regulated utility subsidiaries, Nevada Power Company ("Nevada Power") and Sierra Pacific Power Company (" (collectively, the "Nevada Utilities"). Nevada Power serves retail electric customers in southern Nevada and Sierra Pacific serves natural gas customers in northern Nevada. The Nevada Utilities' combined service territory's economy includes gaming, minin warehousing, manufacturing and governmental services. In addition to retail sales and natural gas transportation, the Nevada Utilitie natural gas on a wholesale basis.

As vertically integrated utilities, BHE's domestic utilities own approximately 27,500 net megawatts of generation capacity under construction. There are seasonal variations in these businesses that are principally related to the use of electricity for air condi gas for heating. Typically, regulated electric revenues are higher in the summer months, while regulated natural gas revenues are hi months.

The Great Britain distribution companies consist of Northern Powergrid (Northeast) Limited and Northern Powergrid (Yor own a substantial electricity distribution network that delivers electricity to end-users in northeast England in an area covering app square miles. The distribution companies primarily charge supply companies regulated tariffs for the use of their distributio

BHE acquired AltaLink L.P. ("AltaLink") on December 1, 2014. AltaLink is a regulated electric transmission-only util headquartered in Calgary, Alberta. AltaLink connects generation plants to major load centers, cities and large industrial plants thro square mile service territory.

The natural gas pipelines consist of Northern Natural Gas Company ("Northern Natural") and Kern River Gas Transmission River"). Northern Natural, based in Nebraska, owns the largest interstate natural gas pipeline system in the United States, as measure reaching from west Texas to Michigan's Upper Peninsula. Northern Natural's pipeline system consists of approximately 14,700 mi pipelines. Northern Natural's extensive pipeline system, which is interconnected with many interstate and intrastate pipelines in the n has access to supplies from multiple major supply basins and provides transportation services to utilities and numerous other cust Natural also operates three underground natural gas storage facilities and two liquefied natural gas storage peaking units. Northern system experiences significant seasonal swings in demand and revenue, with the highest demand typically occurring during the mo through March.

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Kern River, based in Utah, owns an interstate natural gas pipeline system that consists of approximately 1,700 miles and ext areas in the Rocky Mountains to consuming markets in Utah, Nevada and California. Kern River transports natural gas for electric distribution utilities, major oil and natural gas companies or affiliates of such companies, electric generating companies, energy mar companies, and financial institutions.

BHE Renewables is based in Iowa and owns interests in independent power projects having approximately 4,300 net megaw capacity that are in service or under construction in California, Illinois, Texas, Nebraska, New York, Arizona, Minnesota, Kansas, Philippines. These independent power projects sell power generated primarily from solar, wind, geothermal and hydro sources u contracts. Additionally, BHE Renewables has invested approximately $1 billion in seven wind projects sponsored by third parties, co as tax equity investments.

Regulatory Matters

PacifiCorp, MEC and the Nevada Utilities are subject to comprehensive regulation by various federal, state and local agen Energy Regulatory Commission ("FERC") is an independent agency with broad authority to implement provisions of the Federal Pov Gas Act, the Energy Policy Act of 2005 and other federal statutes. The FERC regulates rates for wholesale sales of electricity; transm including pricing and regional planning for the expansion of transmission systems; electric system reliability; utility holding compan records retention; securities issuances; construction and operation of hydroelectric facilities; and other matters. The FERC also has authority to assess civil penalties of up to $1.2 million per day per violation of rules, regulations and orders issued under the Federal also subject to regulation by the Nuclear Regulatory Commission pursuant to the Atomic Energy Act of 1954, as amended, with re ownership of the Quad Cities Nuclear Station.

With certain limited exceptions, BHE's domestic utilities have an exclusive right to serve retail customers within their servic turn, have an obligation to provide service to those customers. In some jurisdictions, certain classes of customers may choose to purc of their energy from alternative energy suppliers, and in some jurisdictions retail customers can generate all or a portion of thei Historically, state regulatory commissions have established retail electric and natural gas rates on a cost-of-service basis, which are d utility an opportunity to recover what each state regulatory commission deems to be the utility's reasonable costs of providing servic opportunity to earn a reasonable return on its investments based on its cost of debt and equity. The retail electric rates of PacifiCor Nevada Utilities are generally based on the cost of providing traditional bundled services, including generation, transmission and dis

Northern Powergrid (Northeast) and Northern Powergrid (Yorkshire) each charge fees for the use of their distribution systems by a formula prescribed by the British electricity regulatory body, the Gas and Electricity Markets Authority. The current eight-year p runs from April 1, 2015 through March 31, 2023.

AltaLink is regulated by the Alberta Utilities Commission ("AUC"), pursuant to the Electric Utilities Act (Alberta), the Pu (Alberta), the Alberta Utilities Commission Act (Alberta) and the Hydro and Electric Energy Act (Alberta). The AUC is an independ agency with broad authority that may impact many of AltaLink's activities, including its tariffs, rates, construction, operations and fi Electric Utilities Act, AltaLink prepares and files applications with the AUC for approval of tariffs to be paid by the Alberta Electric ("AESO") for the use of its transmission facilities, and the terms and conditions governing the use of those facilities. The AESO is system operator in Alberta, Canada that oversees Alberta's integrated electrical system ("AIES") and wholesale electricity marke responsible for directing the safe, reliable and economic operation of the AIES, including long-term transmission system p

The natural gas pipelines are subject to regulation by various federal, state and local agencies. The natural gas pipeline and st Northern Natural and Kern River are regulated by the FERC pursuant to the Natural Gas Act and the Natural Gas Policy Act of 1 authority, the FERC regulates, among other items, (a) rates, charges, terms and conditions of service and (b) the construction and ope pipelines, storage and related facilities, including the extension, expansion or abandonment of such facilities. Interstate natural gas p are also subject to regulations administered by the Office of Pipeline Safety within the Pipeline and Hazardous Materials Safety Ad agency within the DOT. Federal pipeline safety regulations are issued pursuant to the Natural Gas Pipeline Safety Act of 1968, as establishes safety requirements in the design, construction, operation and maintenance of interstate natural gas pipeline fa

Environmental Matters

BHE and its energy businesses are subject to federal, state, local and foreign laws and regulations regarding air and water q portfolio standards, emissions performance standards, climate change, coal combustion byproduct disposal, hazardous and solid protected species and other environmental matters that have the potential to impact current and future operations. In addition to im compliance obligations, these laws and regulations, such as the Federal Clean Air Act, provide regulators with the authority to levy s for noncompliance, including fines, injunctive relief and other sanctions.

The Federal Clean Air Act, as well as state laws and regulations impacting air emissions, provides a framework for protecting nation's air quality and controlling sources of air emissions. These laws and regulations continue to be promulgated and implement the operation of BHE's generating facilities and require them to reduce emissions at those facilities to comply with the requ

Renewable portfolio standards have been established by certain state governments and generally require electricity provi minimum percentage of their power from renewable energy resources by a certain date. Utah, Oregon, Washington, California, Iow adopted renewable portfolio standards. In addition, the potential adoption of state or federal clean energy standards, which inclu non-carbon and renewable electricity generating resources, may also impact electricity generators and natural gas prov

In December 2015, an international agreement was negotiated by 195 nations to create a universal framework for coordinate change in what is referred to as the Paris Agreement. The Paris Agreement reaffirms the goal of limiting global temperature incre degrees Celsius, while urging efforts to limit the increase to 1.5 degrees Celsius; establishes commitments by all parties to make nat contributions and pursue domestic measures aimed at achieving the commitments; commits all countries to submit emissions inve regularly on their emissions and progress made in implementing and achieving their nationally determined commitments; and comm submit new commitments every five years, with the expectation that the commitments will get more aggressive. In the context of th the United States agreed to reduce greenhouse gas emissions 26% to 28% by 2025 from 2005 levels. The Paris Agreement formally November 4, 2016.

Supporting the United States' commitment under the Paris Agreement was the Clean Power Plan, which was finalized by the Protection Agency ("EPA") in August 2015. The Clean Power Plan established the Best System of Emission Reduction for fossil-fue include: (a) heat rate improvements; (b) increased utilization of existing combined-cycle natural gas-fueled generating facilities; a deployment of new and incremental non-carbon generation placed in service after 2012. The final Clean Power Plan compliance scheduled to begin in 2022, and extend through 2030, when fully implemented, the rule was intended to achieve an overall reductio emissions from existing fossil-fueled electric generating units of 32% below 2005 levels.

On June 1, 2017, President Trump announced that the United States would begin the process of withdrawing from the Paris the terms of the Paris Agreement, withdrawal cannot occur until four years after entry into force, making the United States withdr November 2020. The EPA issued a proposal to repeal the Clean Power Plan on October 10, 2017, which has not yet been finalized. 2017, the EPA issued an Advance Notice of Proposed Rulemaking regarding the Clean Power Plan to solicit comment from the pu considers proposing a future rule establishing emission guidelines for greenhouse gas emissions from existing electric generating un of the EPA's recent efforts to repeal the Clean Power Plan are not expected to have a material impact on BHE and its energy subsidi states are adopting legislation and regulations to reduce greenhouse gas emissions, and local governments and consumers are see amounts of clean and renewable energy.

BHE and its energy subsidiaries continue to focus on delivering reliable, affordable, safe and clean energy to its customers mitigate greenhouse gas emissions. For example, as of December 31, 2017, BHE has invested $21 billion in solar, wind, geother generation.

Non-Energy Businesses

HomeServices of America, Inc. ("HomeServices") is the second-largest residential real estate brokerage firm in the United S providing traditional residential real estate brokerage services, HomeServices offers other integrated real estate services, including m and mortgage banking, title and closing services, property and casualty insurance, home warranties, relocation services and other ho It operates under 42 brand names with nearly 41,000 real estate agents in nearly 840 brokerage offices in 30 states and the Distri

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In October 2012, HomeServices acquired a 66.7% interest in one of the largest residential real estate brokerage franchise netw
States, which offers and sells independently owned and operated residential real estate brokerage franchises. HomeServices' franchis
includes over 365 franchisees in over 1,500 brokerage offices in 47 states with over 48,000 real estate agents under three brand nam
certain fees, HomeServices provides the right to use the Berkshire Hathaway HomeServices, Prudential or Real Living brand names
service marks, as well as providing orientation programs, training and consultation services, advertising programs and other

HomeServices' principal sources of revenue are dependent on residential real estate sales, which are generally higher in the
quarters of each year. This business is highly competitive and subject to the general real estate market conditions.

Manufacturing Businesses

Berkshire's numerous and diverse manufacturing businesses are grouped into three categories: (1) industrial products, (2) bui
(3) consumer products. Berkshire's industrial products businesses manufacture specialty chemicals, metal cutting tools, components
power generation applications and a variety of other products primarily for industrial use. The building products group produces fl
insulation, roofing and engineered products, building and engineered components, paint and coatings and bricks and masonry produc
used in building and construction applications. The consumer products group manufactures recreational vehicles, alkaline batteries
products, jewelry and custom picture framing products. Information concerning the major activities of these three groups

Industrial products

Lubrizol Corporation

The Lubrizol Corporation ("Lubrizol") is a specialty chemical company that produces and supplies technologies for the glob
industrial and consumer markets. Lubrizol currently operates in two business sectors: (1) Lubrizol Additives, which includes engine
additives and industrial specialties products; and (2) Lubrizol Advanced Materials, which includes personal and home care, engin
performance coatings and life science solutions.

Lubrizol Additives products are used in a broad range of applications including engine oils, transmission fluids, gear oils, s
lubricants, fuel additives, metalworking fluids, compressor lubricants and greases for transportation and industrial applications. Lu
Materials products are used in several different types of applications including over-the-counter pharmaceutical products, perfor
personal care products, sporting goods and plumbing and fire sprinkler systems. Lubrizol is an industry leader in many of the mar
competes. Lubrizol's principal lubricant additives competitors are Infineum International Ltd., Chevron Oronite Company and A
Corporation. The advanced materials industry is highly fragmented with a variety of competitors in each product lin

From a base of approximately 3,200 patents, Lubrizol uses its technological leadership position in product development a
expertise to improve the quality, value and performance of its products, as well as to help minimize the environmental impact of
Lubrizol uses many specialty and commodity chemical raw materials in its manufacturing processes and uses base oil in processi
additives. Raw materials are primarily feedstocks derived from petroleum and petrochemicals and, generally, are obtainable from se
materials that Lubrizol chooses to purchase from a single source typically are subject to long-term supply contracts to ensure supply
operates facilities in 31 countries (including production facilities in 17 countries and laboratories in 14 countries).

Lubrizol markets its products worldwide through a direct sales organization and sales agents and distributors. Lubrizol's cus
consist of major global and regional oil companies and industrial and consumer products companies that are located in more than 12
of its largest customers also may be suppliers. In 2017, no single customer accounted for more than 10% of Lubrizol's consolidated
continues to implement a multi-year phased investment plan to upgrade operations, ensure compliance with health, safety and e
requirements and increase global manufacturing capacity.

Lubrizol is subject to foreign, federal, state and local laws to protect the environment and limit manufacturing waste and
company believes that its policies, practices and procedures are designed to limit the risk of environmental damage and consequent
Nevertheless, the operation of manufacturing plants entails ongoing environmental risks, and significant costs or liabilities could b
future.

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IMC International Metalworking Companies

IMC International Metalworking Companies (“IMC”) is one of the world’s three largest multinational manufacturers of con carbide metal cutting tools for applications in a broad range of industrial end markets. IMC’s principal brand names include *ISCA* *Ingersoll®*, *Tungaloy®*, *Unitac®*, *UOP®*, *It.te.di®*, *Tool—Flo®* and *Outiltec®*. IMC’s principal manufacturing facilities are located States, Germany, Italy, France, Switzerland, South Korea, China, India, Japan and Brazil.

IMC has five primary product lines: milling tools, gripping tools, turning/thread tools, drilling tools and tooling. The main within each product line between consumable cemented tungsten carbide inserts and steel tool holders. Inserts comprise the vast ma earnings. Metal cutting inserts are used by industrial manufacturers to cut metals and are consumed during their use in cutting ap manufactures hundreds of types of highly engineered inserts within each product line that are tailored to maximize productivity and requirements of customers. IMC’s staff of scientists and engineers continuously develop and innovate products that address end requirements.

IMC’s global sales and marketing network operates in virtually every major manufacturing center around the world staffed engineers and technical personnel. IMC’s customer base is very diverse, with its primary customers being large, multinational bu automotive, aerospace, engineering and machinery industries. IMC operates a regional central warehouse system with locations in Is Belgium, Korea, Japan and Brazil. Additional small quantities of products are maintained at local IMC offices in order to provide support and inventory management.

IMC competes in the metal cutting tools segment of the global metalworking tools market. The segment includes hundreds range from small, private manufacturers of specialized products for niche applications and markets to larger, global multinational b Sandvik and Kennametal, Inc.) with a wide assortment of products and extensive distribution networks. Other manufacturing co Kyocera, Mitsubishi, Sumitomo, Ceratizit and Korloy also play a significant role in the cutting tool market.

Precision Castparts

Berkshire acquired Precision Castparts Corp. (“PCC”) on January 29, 2016. PCC manufactures complex metal componen provides high-quality investment castings, forgings, fasteners/fastener systems and aerostructures for critical aerospace and pow applications. PCC also provides seamless pipe for coal-fired, industrial gas turbine (“IGT”) and nuclear power plants; downhole c fittings and various mill forms in a variety of nickel and steel alloys for severe-service oil and gas environments; investment casting general industrial, armament, medical and other applications; nickel and titanium alloys in all standard mill forms from large ingots foil, sheet, strip, tubing, bar, rod, extruded shapes, rod-in-coil, wire and welding consumables, as well as cobalt alloys, for the aer processing, oil and gas, pollution control and other industries; revert management solutions; fasteners for automotive and general i specialty alloys for the investment casting and forging industries; heat treating and destructive testing services for the investment forging industries; refiner plates and other products for the pulp and paper industry; grinder pumps and affiliated components for lo systems; critical auxiliary equipment and gas monitoring systems for the power generation industry; and metalworking tools for the other applications.

Investment casting technology involves a multi-step process that uses ceramic molds in the manufacture of metal compo complex shapes, closer tolerances and finer surface finishes than parts manufactured using other methods. PCC uses this process products for aircraft engines, IGT’s and other aeroderivative engines, airframes, medical implants, armament, unmanned aerial ve industrial applications. PCC also manufactures high temperature carbon and ceramic composite components, including ceramic mat use in next-generation aerospace engines.

PCC uses forging processes to manufacture components for the aerospace and power generation markets, including seamless industrial gas turbine and nuclear power plants, and downhole casings and tubing pipe for severe service oil and gas markets. PCC performance, nickel-based alloys used to produce forged components for aerospace and non-aerospace applications in such marke chemical processing and pollution control. The titanium products are used to manufacture components for the commercial and milita generation, energy, and industrial end markets.

PCC is also a leading developer and manufacturer of highly engineered fasteners, fastener systems, aerostructures and prec primarily for critical aerospace applications. These products are produced for the aerospace and power and energy markets, as well automotive, heavy truck, farm machinery, mining and construction equipment, shipbuilding, machine tools, medical equipment, recreation markets.

The majority of sales are generated from purchase orders or demand schedules pursuant to long-term agreements. Contractual
for termination by the customer subject to payment for work performed. PCC typically does not experience significant order cance
periodically it receives requests for delays in delivery schedules.

PCC is subject to substantial competition in all of its markets. Components and similar products may be produced by compe
the same types of manufacturing processes or other forms of manufacturing. Although PCC believes its manufacturing processes,
experience provide advantages to its customers, such as high quality, competitive prices and physical properties that often meet more
alternative forms of manufacturing can be used to produce many of the same components and products. Despite intense competition
supplier in most of its principal markets. Several factors, including long-standing customer relationships, technical expertise, state-o
and dedicated employees, aid PCC in maintaining competitive advantages.

A number of raw materials in its products, including certain metals such as nickel, titanium, cobalt, tantalum and molybdenur
a few parts of the world. These metals are required for the alloys used in manufactured products. The availability and costs of thes
influenced by private or governmental cartels, changes in world politics, labor relations between the metal producers and their wo
unstable governments in exporting nations and inflation.

Marmon Holdings

Berkshire currently owns 99.75% of Marmon Holdings, Inc. ("Marmon"), a holding company comprised of three autonon
consisting of Marmon Engineered Components Company ("Engineered Components"), Marmon Retail Technologies Company ("Re
and Marmon Energy Services Company ("Energy Services"). Energy Services includes the transportation equipment manufacturing,
businesses (UTLX Company), which is discussed in the Finance and Financial Products businesses section of this Item. Engineered C
Technologies and the Engineered Wire and Cable sector of Energy Services comprise "Marmon manufacturing". Marmon manufa
approximately 400 manufacturing, distribution, and service facilities, which are located primarily in the United States as well as in
worldwide.

Engineered Components:

Plumbing, Industrial & Automotive Components supplies copper, aluminum, and stainless steel tubing and fittings for the pl
and aerospace markets, aluminum and brass forgings for many commercial and industrial applications, adhesives primarily for a
aerospace applications, clutches, engine mounts, and related components for the light-duty vehicle aftermarket; and precision m
components for safety, electrical, and fluid transfer applications in the automotive market.

Electrical Products produces electrical building wire for residential, commercial, and industrial buildings, portable lightin
mining and safety markets and overhead electrification equipment for mass transit systems.

Metal Services provides specialty metal pipe, tubing, beams and related value-added services to a broad range of in

Construction Fasteners & Safety Products supplies fasteners and hand and arm protective wear to the construction, industrial

Highway Technologies serves the heavy-duty highway transportation industry with trailers, truck and trailer components inc
coupling solutions, wheel-end products, undercarriage products, and fenders, as well as truck modification services

Retail Technologies:

Retail Food Technologies and *Restaurant & Catering Technologies* supplies commercial food preparation and holding equipm
fast food chains, hotels and caterers.

Beverage Technologies produces beverage dispensing and cooling equipment for foodservice retailers as well as on-shelf ma
for single-serve beverages and pre-tooled stock solutions for in-store applications.

Water Technologies manufactures and markets residential water softening, purification, and refrigeration filtration systems, tr
industrial markets including power generation, oil and gas, chemical, and pulp and paper, gear drives for irrigation systems and co
air-cooled heat exchangers.

Retail Solutions provides retail environment design services, marketing programs, in-store digital merchandising, display fi
material handling, and security carts as well as automation equipment for many industries, and consumer products sold through r
including work and garden gloves, air compressors and extension cords.

The Engineered Wire & Cable sector supplies electrical and electronic wire and cable for energy related markets and otl

Other industrial products

CTB International Corp. (“CTB”), headquartered in Milford, Indiana, is a leading global designer, manufacturer and markete agricultural systems and solutions for preserving grain, producing poultry, pigs and eggs, and for processing poultry, fish, vegetable CTB operates from facilities located around the globe and supports customers through a worldwide network of independent distrib

CTB competes with a variety of manufacturers and suppliers, many of which offer only a limited number of the products of two of which offer products across many of CTB’s product lines. Competition is based on the price, value, reputation, quality and de offered and the customer service provided by distributors, dealers and manufacturers of the products. CTB’s leading brand names, di diversified product line, product support and high-quality products enable it to compete effectively. CTB manufactures its product galvanized steel, steel wire, stainless steel and polymer materials and supplies of these materials have been sufficient in rec

In 2014, Berkshire acquired a global supplier of pipeline flow improver products from Phillips 66. The business, headquar Texas, was named Phillips Specialty Products, Inc. at the time of the acquisition and is currently named LiquidPower Specialty Prod LSPI specializes in maximizing the flow potential of pipelines, increasing operational flexibility and throughput capacity. The Scott are a group of businesses that manufacture, distribute, service and finance a wide variety of products for residential, industrial and

Berkshire’s industrial products manufacturers employ approximately 72,000 persons.

Building Products

Shaw Industries

Shaw Industries Group, Inc. (“Shaw”), headquartered in Dalton, Georgia, is a leading carpet manufacturer based on both reve production. Shaw designs and manufactures over 3,800 styles of tufted carpet, wood and resilient flooring for residential and com about 30 brand and trade names and under certain private labels. Shaw also provides project management and installation serv manufacturing operations are fully integrated from the processing of raw materials used to make fiber through the finishing of ca manufactures or distributes a variety of hardwood, vinyl and laminate floor products (“hard surfaces”). In 2016, Shaw acquired USF a leading innovator and marketer of wood-plastic composite luxury vinyl tile flooring, as well as cork, bamboo and hardwood produ and hard surface products are sold in a broad range of patterns, colors and textures. Shaw operates Shaw Sports Turf and South International, LLC, which provide synthetic sports turf, golf greens and landscape turf products.

Shaw products are sold wholesale to over 34,000 retailers, distributors and commercial users throughout the United States, C and are also exported to various overseas markets. Shaw’s wholesale products are marketed domestically by over 2,700 salaried and personnel directly to retailers and distributors and to large national accounts. Shaw’s seven carpet, seven hard surface and two sa distribution facilities and 25 redistribution centers, along with centralized management information systems, enable it to provide pr delivery of its products to both its retail customers and wholesale distributors.

Substantially all carpet manufactured by Shaw is tufted carpet made from nylon, polypropylene and polyester. In the tuftin inserted by multiple needles into a synthetic backing, forming loops, which may be cut or left uncut, depending on the desired textu During 2017, Shaw processed approximately 99% of its requirements for carpet yarn in its own yarn processing facilities. The av materials continues to be good but costs are impacted by petro-chemical and natural gas price changes. Raw material cost changes factored into selling prices to customers.

The floor covering industry is highly competitive with more than 100 companies engaged in the manufacture and sale of ca States and numerous manufacturers engaged in hard surface floor covering production and sales. According to industry estimates, c approximately 50% of the total United States consumption of all flooring types. The principal competitive measures within the floo are quality, style, price and service.

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Johns Manville

Johns Manville ("JM") is a leading manufacturer and marketer of premium-quality products for building, mechanical and in commercial roofing and roof insulation, as well as engineered fibers and nonwovens for commercial, industrial and residential appli markets that include building, flooring, interiors, aerospace, automotive and transportation, air handling, appliance, HVAC, pipe ins waterproofing and wind energy. Fiberglass is the basic material in a majority of JM's products, although JM also manufactures a sig its products with other materials to satisfy the broader needs of its customers. Raw materials are readily available in sufficient quant sources for JM to maintain and expand its current production levels. JM regards its patents and licenses as valuable, however it does its businesses to be materially dependent on any single patent or license. JM is headquartered in Denver, Colorado, and operates 4 facilities in North America, Europe and China and conducts research and development at its technical center in Littleton, Colorado a in the U.S. and Europe.

Fiberglass is made from earthen raw materials and recycled glass, together with proprietary organic and acrylic-based formal to bind many of its glass fibers. JM's products also contain materials other than fiberglass, including various chemical and petro- materials used in roofing and other specialized products. JM uses recycled material when available and suitable to satisfy the broa customers. The raw materials used in these various products are readily available in sufficient quantities from various sources to mai current production levels.

JM's operations are subject to a variety of federal, state and local environmental laws and regulations. These laws and regul discharge of materials into the air, land and water and govern the use and disposal of hazardous substances. The most relevant of the Federal Clean Air Act, the Clean Water Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act and th Environmental Response, Compensation and Liability Act of 1980, which are administered by the EPA. In 2015, the EPA revised pollutant rules for the wool fiberglass and mineral wool manufacturing industries. While the new rules implement new emission sta expected to require material expenditures to meet the compliance dates in 2018.

JM sells its products through a wide variety of channels including contractors, distributors, retailers, manufacturers and fabri in a highly competitive market, with competitors comprised primarily of several large global and national manufacturers and sm manufacturers. JM holds leadership positions in the key markets that it serves. JM's products compete primarily on the basis of differentiation and customization and breadth of product line. Sales of JM's products are moderately seasonal due to increases in co that typically occur in the second and third quarters of the calendar year. JM is seeing a trend in customer purchasing decisions bein sustainable and energy efficient attributes of its products, services and operations.

MiTek Industries, Inc.

MiTek Industries, Inc. ("MiTek"), based in Chesterfield, Missouri, operates in three separate markets: residential, commerc MiTek operates worldwide with sales in over 100 countries and with manufacturing facilities and/or sales/engineering offices locat MiTek has completed a number of bolt-on acquisitions in the past five years, intended to diversify product offerings and reduce t cyclical global housing markets.

In the residential market, MiTek is a leading supplier of engineered connector products, construction hardware, engineeri services and computer-driven manufacturing machinery to the truss component market of the building components industry. MiTek's are component manufacturers who manufacture prefabricated roof and floor trusses and wall panels for the residential building mark construction hardware to commercial distributors and do-it-yourself retail stores under the MiTek Builders Products n

MiTek's commercial market business includes products and services sold to the commercial construction industry. Product curtain wall systems (Benson Industries, Inc.), anchoring systems for masonry and stone (Hohmann & Barnard, Inc.), light gauge ste (Aegis Metal Framing Division of MiTek USA, Inc.), engineering services for a proprietary high-performance steel frame conne Systems, Inc.) and a comprehensive range of round, rectangular, oval and spiral ductwork for the ventilation market (M&M Manuf Snappy ADP, Inc.).

MiTek's industrial market business includes: automated machinery for the battery manufacturing industry (TBS Engineeri customized air handling systems sold to commercial, institutional and industrial markets (TMI Climate Solutions, Inc.), design and Safety Related HVAC systems and components (Ellis & Watts Global Industries, Inc.), energy recovery and dehumidification syste applications (Heat-Pipe Technology, Inc.) and pre-engineered and pre-fabricated custom structural mezzanines and platforms for manufacturing facilities (Cubic Designs, Inc. and Mezzanine International, Ltd.).

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A significant raw material used by MiTek is hot dipped galvanized sheet steel. While supplies are presently adequate, variati historically occurred, producing significant variations in cost and availability.

Benjamin Moore

Benjamin Moore & Co. ("Benjamin Moore"), headquartered in Montvale, New Jersey, is a leading formulator, manufacture broad range of architectural coatings, available principally in the United States and Canada. Products include water-based and solve purpose coatings (paints, stains and clear finishes) for use by the consumers, contractors and industrial and commercial users. Prod under various registered brand names, including, but not limited to: *Aura®, Natura®, Regal Select®, Ultra Spec®, ben®, Eco Spe Corotech®, Insl-x®, Lenmar®, Super Kote®, Arborcoat®, Super Hide®, Century®, Ultra Spec®, SCUFF-X® and Notal*

Benjamin Moore relies primarily on an independent dealer network for distribution of its products. Benjamin Moore's dist includes over 3,300 independent retailers currently representing over 5,000 storefronts in the United States and Canada. The indepen offers a broad array of products including *Benjamin Moore®, Coronado®* and *Insl-x®* brands and other competitor coatings, wall c treatments and sundries. In addition, Benjamin Moore operates an on-line "pick up in store" program, which allows consumers to p e-commerce site or for national accounts and government agencies via its customer information center. These orders may be picked u nearest dealer.

Benjamin Moore competes with numerous manufacturers, distributors and paint, coatings and related products retailers. Prod innovation, breadth of product line, technical expertise, service and price determine the competitive advantage. Competitors includ decorating stores, mass merchandisers, home centers, independent hardware stores, hardware chains and manufacturer-operated dire Sherwin-Williams Company, PPG Industries, Inc., The Valspar Corporation, The Home Depot, Inc. and Lowe's Compa

The most significant raw materials in Benjamin Moore products are titanium dioxide, solvents, and epoxy and other resins. materials have been generally available, with pricing and availability subject to fluctuation.

Acme Brick

Acme Brick Company ("Acme") headquartered in Fort Worth, Texas, manufactures and distributes clay bricks (*Acme Brick* (*Featherlite*) and cut limestone *(Texas Quarries).* In addition, Acme and its subsidiaries distribute a number of other building pr manufacturers, including floor and wall tile, wood flooring and other masonry products. Products are sold primarily in the South C Eastern United States through company-operated sales offices. Acme distributes products primarily to homebuilders and mason contractors.

Acme and its affiliates operate 25 clay brick manufacturing facilities at 21 sites located in eight states, six concrete block fac two stone fabrication facilities located in Texas and Alabama. In addition, Acme and its subsidiaries operate a glass block fabrication bagging facility and a stone burnishing facility, all located in Texas. The demand for Acme's products is seasonal, with higher sale weather months, and is subject to the level of construction activity, which is cyclical. Acme also owns and leases properties and m supply raw materials used in many of its manufactured products. Acme's raw materials supply is believed to be adequ

The brick industry is subject to the EPA's Maximum Achievable Control Technology Rule (MACT Rule) finalized in Octob deadline for compliance of December 31, 2018. Key elements of the MACT Rule include emission limits established for certain haza and acidic gases. The MACT Rule also establishes work practices for "periodic" kilns, including using a designed firing time and te product, labeling maximum loads, keeping a log of each load, and developing and implementing inspection and maintenance procedu Acme's facilities are in compliance, additional capital expenditures may be required to bring other facilities into compliance by

Berkshire's building products manufacturers employ approximately 39,000 people.

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Consumer Products

Apparel

Fruit of the Loom ("FOL") is headquartered in Bowling Green, Kentucky. FOL is primarily a manufacturer and distributor underwear, casualwear, athletic apparel and hardgoods. Products, under the *Fruit of the Loom*® and *JERZEES*® labels are primarily merchandise, mid-tier chains and wholesale markets. In the Vanity Fair Brands product line, *Vassarette*® and *Curvation*® are so merchandise market, while *Vanity Fair*® and *Lily of France*® products are sold to mid-tier chains and department stores. FOL also athletic uniforms, apparel, sports equipment and balls to team dealers; collegiate licensed tee shirts and fleecewear to college books apparel, sports equipment and balls to sporting goods retailers under the *Russell Athletic*® and *Spalding*® brands. Additionally, *Spal* sells balls in the mass merchandise market and dollar store channels. In 2015, FOL exited an unprofitable intimate apparel business i a significant portion of FOL's sales were to Walmart.

FOL generally performs its own knitting, cloth finishing, cutting, sewing and packaging for apparel. For the North Americ comprised about 84% of FOL's net sales in 2017, the majority of its cloth manufacturing was performed in Honduras. Labor-intensi and packaging operations are located in Central America and the Caribbean. For the European market, products are either sourced contractors in Europe or Asia or sewn in Morocco from textiles internally produced in Morocco. FOL's bras, athletic equipment, sp other athletic apparel lines are generally sourced from third-party contractors located primarily in Asia.

U.S. grown cotton and polyester fibers are the main raw materials used in the manufacturing of FOL's apparel products and a limited number of third-party suppliers. Additionally in 2015, FOL entered into an eight year agreement with one key supplier to pro FOL's yarn. Management currently believes there are readily available alternative sources of raw materials and yarn. However, if r suppliers cannot be maintained or delays occur in obtaining alternative sources of supply, production could be adversely affected, w corresponding adverse effect on results of operations. Additionally, raw materials are subject to price volatility caused by weather, s government regulations, economic climate and other unpredictable factors. FOL has secured contracts to purchase cotton, either dire yarn suppliers, to meet the majority of its production plans for 2018. FOL's markets are highly competitive, consisting of many dor manufacturers and distributors. Competition is generally based upon product features, quality, customer service and p

Garan designs, manufactures, imports and sells apparel primarily for children, including boys, girls, toddlers and infants. Prod its own trademark *Garanimals*® and customer private label brands. Garan also licenses its registered trademark *Garanimals*® to thir and non-apparel products. Garan conducts its business through operating subsidiaries located in the United States, Central Ame Substantially all of Garan's products are sold through its distribution centers in the United States with sales to Walmart representin sales. Fechheimer Brothers manufactures, distributes and sells uniforms, principally for the public service and safety markets, inclu postal and military markets. Fechheimer Brothers is based in Cincinnati, Ohio.

The H.H. Brown Shoe Group manufactures and distributes work, rugged outdoor and casual shoes and western-style footwea brand names, including *Justin, Tony Lama®, Nocona®, Chippewa®, BØRN® , B•Ø•C®, Carolina®, Söfft, Double-H Boots®, Nu Comfortiva®.* Brooks Sports markets and sells performance running footwear and apparel to specialty and national retailers and dire under the *Brooks*® brand. A significant volume of the shoes sold by Berkshire's shoe businesses are manufactured or purchased from United States. Products are sold worldwide through a variety of channels including department stores, footwear chains, specialty stor Internet, as well as through company-owned retail stores.

Other consumer products

Forest River, Inc. ("Forest River") is a manufacturer of recreational vehicles ("RV"), utility cargo trailers, buses and po headquartered in Elkhart, Indiana with products sold in the United States and Canada through an independent dealer network. Fo numerous manufacturing facilities located in six states. Forest River is a leading manufacturer of RVs with brand names such as Be Cedar Creek, Cherokee, Coachman, Dynamax, Flagstaff, Forester, Georgetown, Palomino, Prime Time Manufacturing, Puma, Ro Sandpiper, Sierra, Sunseeker, Surveyor, Viking RV and Wildwood. Utility cargo trailers are sold under Cargo Mate, Continental, Ra brand names among others. Buses are sold under the Battisti, Berkshire Coach, Elkhart Coach, Glaval Bus, Starcraft Bus, and Sta names. Pontoon boats are sold under the Berkshire, South Bay and Trifecta brand names. The RV industry is very competitive. Co primarily on price, design, quality and service. The industry has consolidated over the past several years with Forest River and its l possessing about 83% aggregate market share, with Forest River holding a 35% market share.

Berkshire acquired the Duracell Company (“Duracell’), on February 29, 2016 from The Procter & Gamble Company. Durace
Chicago, Illinois, is a leading manufacturer of high performance alkaline batteries. Duracell manufactures batteries in the U.S., Euro
provides a network of worldwide sales and distribution centers. Costco and Walmart are significant customers, representing appro
Duracell’s annual revenue. There are several competitors in the battery manufacturing market with Duracell holding an approximately
of the global alkaline battery market. Management believes there are sufficient sources of raw materials, which primarily include
manganese.

Albecca Inc. (“Albecca”), headquartered in Norcross, Georgia, has operations in the U.S., Canada and 13 countries outside
and operates primarily under the *Larson-Juhl®* name. Albecca designs, manufactures and distributes a complete line of high quality
framing products, including wood and metal moulding, matboard, foamboard, glass and framing supplies. Complementary to its fr
Albecca offers art printing and fulfillment services.

Richline Group, Inc. operates four strategic business units: Richline Jewelry, LeachGarner, Rio Grande and Inverness. Each
manufacturer and distributor of jewelry with precious metal and non-precious metal products to specific target markets including lar
department stores, shopping networks, mass merchandisers, e-commerce retailers and artisans plus worldwide manufacturers and w
medical, electronic and aerospace industries.

Berkshire’s consumer products manufacturers employ approximately 54,000 persons.

Service and Retailing Businesses

Service Businesses

Berkshire’s service businesses provide grocery and foodservice distribution, professional aviation training programs, fra
ownership programs and distribution of electronic components. Other service businesses include franchising and servicing of quick s
media businesses (newspaper, television and information distribution), as well as logistics businesses. Berkshire’s service busin
approximately 46,000 people. Information concerning these activities follows.

McLane Company

McLane Company, Inc. (“McLane”) provides wholesale distribution services in all 50 states to customers that include con
discount retailers, wholesale clubs, drug stores, military bases, quick service restaurants and casual dining restaurants. McLane pro
distribution services to Walmart, which accounts for approximately 25% of McLane’s revenues. McLane’s other significant customer
and Yum! Brands, each of which accounted for approximately 11% of McLane’s revenues in 2017. A curtailment of purchasing by W
significant customers could have a material adverse impact on McLane’s periodic revenues and earnings. McLane’s business model
volume of sales, rapid inventory turnover and stringent expense controls. Operations are currently divided into three business units: g
foodservice distribution and beverage distribution.

McLane’s grocery distribution unit, based in Temple, Texas, maintains a dominant market share within the convenience store
most of the national convenience store chains and major oil company retail outlets. Grocery operations provide products to approxin
locations nationwide, including Walmart. McLane’s grocery distribution unit operates 23 distribution facilities in 20 st

McLane’s foodservice distribution unit, based in Carrollton, Texas, focuses on serving the quick service and casual dining r
with high quality, timely-delivered products. Operations are conducted through 50 facilities in 22 states. The foodservice distribut
approximately 36,500 chain restaurants nationwide.

Through its subsidiaries, McLane also operates several wholesale distributors of distilled spirits, wine and beer. Operation
through 14 distribution centers in Georgia, North Carolina, Tennessee and Colorado. These beverage units operating as Empire Dis
Distributors of North Carolina, Empire Distributors of Tennessee and Baroness Small Estates, service approximately 24,900 retail
Southeastern United States and Colorado.

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FlightSafety International

FlightSafety International Inc. ("FlightSafety"), headquartered at New York's LaGuardia Airport, is an industry leader in pro training services to individuals, businesses (including certain commercial aviation companies) and the U.S. government and ce governments. FlightSafety provides high technology training to pilots, aircraft maintenance technicians, flight attendants and dispat and support a wide variety of business, commercial and military aircraft. FlightSafety operates a large fleet of advanced full flight learning centers and training locations in the United States, Canada, China, France, Japan, Norway, Singapore, South Africa, the Ne United Kingdom. The vast majority of FlightSafety's instructors, training programs and flight simulators are qualified by the Unit Aviation Administration and other aviation regulatory agencies around the world.

FlightSafety is also a leader in the design and manufacture of full flight simulators, visual systems, displays and other adva training devices. This equipment is used to support FlightSafety training programs and is offered for sale to airlines and governm organizations around the world. Manufacturing facilities are located in Oklahoma, Missouri and Texas. FlightSafety strives to mainta simulators and develop courseware using state-of-the-art technology and invests in research and development as it builds new equip programs.

NetJets

NetJets Inc. ("NetJets") is the world's leading provider of shared ownership programs for general aviation aircraft. NetJets' g is located in Columbus, Ohio, with most of its logistical and flight operations based at Port Columbus International Airport. Net operations are based in Lisbon, Portugal. The shared ownership concept is designed to meet the travel needs of customers who re flexibility and access of a large fleet that whole aircraft ownership cannot deliver. In addition, shared ownership programs are avail flight departments seeking to outsource their general aviation needs or add capacity for peak periods and for others that previously

With a focus on safety and service, NetJets' programs are designed to offer customers guaranteed availability of aircraft, pre costs and increased liquidity. NetJets' shared aircraft ownership programs permit customers to acquire a specific percentage of a cert allows customers to utilize the aircraft for a specified number of flight hours annually. In addition, NetJets offers prepaid flight cards solutions and services for aircraft management, customized aircraft sales and acquisition, ground support and flight operation servic of programs including NetJets Shares™, NetJets Leases™ and the Marquis Jet Card®.

NetJets is subject to the rules and regulations of the United States Federal Aviation Administration, the National Institute of Portugal and the European Aviation Safety Agency. Regulations address aircraft registration, maintenance requirements, pilot qualifi operations, including flight planning and scheduling as well as security issues and other matters.

TTI, Inc.

TTI, Inc. ("TTI"), headquartered in Fort Worth, Texas, is a global specialty distributor of passive, interconnect, electromecha semiconductor components used by customers in the manufacturing and assembling of electronic products. TTI's customer base i equipment manufacturers, electronic manufacturing services, original design manufacturers, military and commercial customers, as system engineers. TTI's distribution agreements with the industry's leading suppliers allow it to uniquely leverage its product cost business by providing new lines and products to its customers. TTI operates sales offices and distribution centers from more tha throughout North America, Europe, Asia and Israel.

TTI services a variety of industries including telecommunications, medical devices, computers and office equipment, mil automotive and consumer electronics. TTI's core customers include businesses in the design through production stages in the elect supply chain, which supports its high volume business, and its Mouser subsidiary, which supports a broader base of customers wi purchases through internet based marketing. Sager Electrical Supply Company, Inc. is a subsidiary of TTI located in Massachusetts focus is the distribution of power components within the electronics distribution market.

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Other services

International Dairy Queen develops and services a worldwide system of over 6,800 stores operating primarily under the nar *Chill®, Dairy Queen®* and *Orange Julius®* that offer various dairy desserts, beverages, prepared foods and blended fruit drinks. Busi electronic dissemination of full-text news releases to the media, online services and databases and the global investment communit and in 45 languages. Approximately 97% of Business Wire's revenues derive from its core news distribution business. The Buffalo N Group, Inc. are publishers of 32 daily and 44 weekly newspapers. WPLG, Inc. is an ABC affiliate broadcast station in Miami, Flo Brokerage is a leading non-asset based third party logistics provider to the petroleum and chemical industries.

Retailing Businesses

Berkshire's retailing businesses include automotive, home furnishings and several other operations that sell various consu consumers. Information regarding each of these operations follows. Berkshire's retailing businesses employ approximately 29

Berkshire Hathaway Automotive

In the first quarter of 2015, Berkshire acquired a group of affiliated companies referred to as the Berkshire Hathaway Auton (BHA). BHA is one of the largest automotive retailers in the United States, currently operating 109 new vehicle franchises throug located primarily in major metropolitan markets in the United States. The dealerships sell new and used vehicles, vehicle mainten services, extended service contracts, vehicle protection products and other aftermarket products. BHA also arranges financing for its third-party lenders. BHA operates 30 collision service centers directly connected to the dealerships' operations and owns and operate and a fluid maintenance products distribution company.

Dealership operations are highly concentrated in the Arizona and Texas markets, with approximately 70% of dealership-relate from sales in these markets. BHA currently maintains franchise agreements with 27 different vehicle manufacturers, although it der portion of its revenue from the Toyota/Lexus, General Motors, Ford/Lincoln, Nissan/Infiniti and Honda/Acura brands. Over 85% of from dealerships representing these manufacturers.

The retail automotive industry is highly competitive. BHA faces competition from other large public and private dealership individual franchised dealerships and competition via the Internet. Given the pricing transparency available via the Internet, and the dealers acquire vehicles from the manufacturers on the same terms irrespective of volume, the location and quality of the dealership service and transaction speed are key differentiators in attracting customers.

BHA's overall relationships with the automobile manufacturers are governed by framework agreements. The framework ag provisions relating to the management, operation, acquisition and the ownership structure of BHA's dealerships. Failure to meet th agreements could adversely impact BHA's ability to acquire additional dealerships representing those manufacturers. Additionally, contain limitations on the number of dealerships from a specific manufacturer that may be owned by BHA.

Individual dealerships operate under franchise agreements with the manufacturer, which grants the dealership entity a non-ex the manufacturer's brand of vehicles and offer related parts and service within a specified market area, as well as the right to use th trademarks. The agreements contain various requirements and restrictions related to the management and operation of the franchis provide for termination of the agreement by the manufacturer or non-renewal for a variety of causes. The states generally have auto franchise laws that provide substantial protection to the franchisee, and it is difficult for a manufacturer to terminate or not renew a f outside of bankruptcy or with "good cause" under the applicable state franchise law.

BHA owns facilities with approximately 6.0 million square feet of space and approximately 970 acres of land that are utilize BHA also develops, underwrites and administers various vehicle protection plans as well as life and accident and health insuranc consumers through BHA's dealerships and third party dealerships. BHA also develops proprietary training programs and material ongoing monitoring and training of the dealership's finance and insurance personnel.

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Home furnishings retailing

The home furnishings businesses consist of Nebraska Furniture Mart ("NFM"), R.C. Willey Home Furnishings ("R.C. Wille Company ("Star") and Jordan's Furniture, Inc. ("Jordan's"). These businesses offer a wide selection of furniture, bedding and acces NFM and R.C. Willey sell a full line of major household appliances, electronics, computers and other home furnishings and offer cus complement their retail operations. An important feature of each of these businesses is their ability to control costs and to produce hi by offering significant value to their customers.

NFM operates its business from three large retail complexes with almost 2.8 million square feet of retail space and sizable administrative facilities in Omaha, Nebraska, Kansas City, Kansas and The Colony, Texas (a suburb of Dallas). NFM is the largest f each of these markets. The Colony, Texas store opened in 2015 and includes retail space of approximately 560,000 square feet. N Homemakers Furniture located in Des Moines, Iowa, which has approximately 215,000 square feet of retail space. R.C. Willey, base Utah, is the dominant home furnishings retailer in the Intermountain West region of the United States. R.C. Willey currently operates three distribution centers. These facilities include approximately 1.3 million square feet of retail space with six stores located in Utah three stores in Nevada and one store in California.

Jordan's operates a retail furniture business from six locations with approximately 770,000 square feet of retail space in s Massachusetts, New Hampshire, Rhode Island and Connecticut. The retail stores are supported by an 800,000 square foot distributio Massachusetts. Jordan's is the largest furniture retailer, as measured by sales, in Massachusetts and New Hampshire. Jordan's is w markets for its unique store arrangements and advertising campaigns. Star's retail facilities include about 700,000 square feet of r locations in Texas with eight in Houston. Star maintains a dominant position in each of its markets.

Other retailing

Borsheim Jewelry Company, Inc. ("Borsheims") operates from a single store in Omaha, Nebraska. Borsheims is a high volu jewelry, watches, crystal, china, stemware, flatware, gifts and collectibles. Helzberg's Diamond Shops, Inc. ("Helzberg") is based in Missouri, and operates a chain of 213 retail jewelry stores in 36 states, which includes approximately 460,000 square feet of retail s stores are located in malls, lifestyle centers, power strip centers and outlet malls, and all stores operate under the name *Helzberg Diam Diamonds Outlet*®. The Ben Bridge Corporation ("Ben Bridge Jeweler"), based in Seattle, Washington, operates a chain of 93 upsc stores located in 11 states primarily in the Western United States and in British Columbia, Canada. Forty-four of its retail locations that sell only PANDORA jewelry. Principal products include finished jewelry and timepieces. Ben Bridge Jeweler stores are located shopping malls.

See's Candies ("See's") produces boxed chocolates and other confectionery products with an emphasis on quality and disti large kitchens in Los Angeles and San Francisco and one smaller facility in Burlingame, California. See's operates approximately 24 discount stores located mainly in California and other Western states. See's revenues are highly seasonal with nearly half of its annu in the fourth quarter.

The Pampered Chef, Ltd. ("Pampered Chef") is a premier direct seller of distinctive high quality kitchenware products with United States, Canada and Germany. Pampered Chef's product portfolio consists of approximately 400 Pampered Chef® branded ki categories ranging from stoneware and cutlery to grilling and entertaining. Pampered Chef's products are available online as well a force of independent cooking consultants.

Oriental Trading Company ("OTC") is a leading multi-channel retailer and online destination for value-priced party supplies, and novelties, school supplies and educational games. OTC, headquartered in Omaha, Nebraska, serves a broad base of nearly four annually, including consumers, schools, churches, non-profit organizations, medical and dental offices and other businesses. OTC o products on its websites, and utilizes sophisticated digital and print marketing efforts.

In April 2015, Berkshire acquired Detlev Louis Motorrad ("Louis") which is headquartered in Hamburg, Germany. Louis is a motorcycle apparel and equipment in Europe. Louis carries over 32,000 different products from more than 600 manufacturers, prim clothing, technical equipment and leisure markets. Louis has over 70 stores in Germany and Austria and also sells through catalogs a throughout most of Europe.

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Finance and Financial Products

Berkshire’s finance and financial products activities include an integrated manufactured housing and finance business, transp leasing and furniture leasing. Berkshire’s finance and financial products businesses employ approximately 25,600 people in the aggr concerning these activities follows.

Clayton Homes

Clayton Homes, Inc. (“Clayton”), headquartered near Knoxville, Tennessee, is a vertically integrated housing company utiliz modular and site built methods. Clayton’s homes are marketed in 48 states through a network of over 2,000 retailers, including 353 home centers and 118 subdivisions. Home finance and insurance products are offered through its subsidiaries primarily to purchaser and modular homes.

In 2015, Clayton acquired its first site builder and has since added four additional site builders. Clayton plans to continue to that fit its business model. Clayton delivered approximately 49,000 homes in 2017 at various price points. Clayton competes based delivery capabilities and product performance and considers the ability to make financing available to retail purchasers a factor aff acceptance of its products.

Clayton’s financing programs support company-owned home centers and select independent retailers. Proprietary loan under have been developed and include ability to repay calculations, including debt to income limits, consideration of residual income a requirements, which are considered in evaluating loan applicants. Currently, approximately 70% of the loan originations are home-o remaining 30% have land as additional collateral. The average down payment is approximately 15%, which may be from cash, trad Certain loan types require an independent third-party valuation; additionally, if land is involved in the transaction it generally is indep in order to establish the value of the land only or the home and the land as a package. Originated loans are at fixed rates and for fix outstanding include non-government originations, bulk purchases of contracts and notes from banks and other lenders. Clayton also financing to certain independent retailers and community operators and services housing contracts and notes that were not purchased bulk contract purchases and servicing arrangements may relate to the portfolios of other lenders or finance companies, governmental entities that purchase and hold housing contracts and notes. Clayton also acts as an agent on physical damage insurance policies, hom plan policies and other programs.

Transportation Equipment Leasing

UTLX Company (“UTLX”), headquartered in Chicago, Illinois, operates railcar, crane, intermodal tank container, manufact businesses under several brand names. Union Tank Car is a leading designer, builder and full-service lessor of tank cars and other sp Union Tank Car and its Canadian affiliate Procor own a fleet of over 130,000 railcars which they lease to chemical, petrochemic agricultural/food customers across North America, supported by railcar repair facilities and mobile units. Union Tank Car also manuf two U.S. plants. Sterling Crane located in Canada and the U.S. and Freo Group located in Australia are major mobile crane service pr fleet of approximately 1,000 cranes primarily serving energy, mining and petrochemical markets. EXSIF Worldwide is a leading inte intermodal tank containers with a fleet of approximately 50,000 units primarily serving chemical producers and logistics o

UTLX has a large number of customers diversified both geographically and across industries. UTLX, while subject to cyclica competition in all of its markets, competes by offering a broad range of high quality products and services targeted at its niche geographically strategic locations. Railcars and intermodal tank containers are usually leased for multiple-year terms and most of the upon expiration. As a result of selective ongoing capital investment and high maintenance standards, utilization rates (the number o total units available) of UTLX’s railcar, crane and intermodal tank container equipment are generally relatively high. Following the gas related markets in recent years, renewal rental rates have declined in each of these markets and has precipitated a decline in util railcar leasing business, which has a meaningful effect on UTLX. While tank cars operate in a highly regulated environment in N regulatory changes are not expected to materially impact UTLX’s operational capability, competitive position, or financial

XTRA Corporation (“XTRA”), headquartered in St. Louis, Missouri, is a leading transportation equipment lessor operating Lease® brand name. XTRA manages a diverse fleet of approximately 81,000 units located at 51 facilities throughout the United S includes over-the-road and storage trailers, chassis, temperature controlled vans and flatbed trailers. XTRA is one of the largest lesso available) of over-the-road trailers in North America. Transportation equipment customers lease equipment to cover cyclical, season needs and as a substitute for purchasing equipment. Therefore, as a provider of marginal capacity to its customers, XTRA’s utiliz operating results tend to be cyclical. In addition, transportation providers often use leasing to maximize their asset utilization and expenditures. By maintaining a large fleet, XTRA is able to provide customers with a broad selection of equipment and quick re

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Other financial activities

CORT Business Services Corporation is the leading national provider of rental relocation services including rental furniture related services in the "rent-to-rent" market of the furniture rental industry. BH Finance LLC invests in fixed-income and equity

Additional information with respect to Berkshire's businesses

Revenue, earnings before taxes and identifiable assets attributable to Berkshire's reportable business segments are include Berkshire's Consolidated Financial Statements contained in Item 8, Financial Statements and Supplementary Data. Additional infor Berkshire's investments in fixed maturity and equity securities is included in Notes 3 and 4, respectively, to Berkshire's Consoli Statements.

Since June 2013, Berkshire has maintained significant investments in H.J. Heinz Holding Corporation (now The Kraft He Information concerning these investments is included in Note 5 to Berkshire's Consolidated Financial Statements. Kraft Heinz is one and beverage companies in the world, with sales in approximately 190 countries and territories. Kraft Heinz manufactures and m beverage products, including condiments and sauces, cheese and dairy meals, meats, refreshment beverages, coffee and other gro throughout the world, under a host of iconic brands including *Heinz, Kraft, Oscar Mayer, Philadelphia, Velveeta, Lunchables, Plante Capri Sun, Ore-Ida, Kool-Aid and Jell-O*.

Berkshire maintains a website (*http://www.berkshirehathaway.com*) where its annual reports, certain corporate governance releases, interim shareholder reports and links to its subsidiaries' websites can be found. Berkshire's periodic reports filed with the S Form 10-K, Form 10-Q, Form 8-K and amendments thereto, may be accessed by the public free of charge from the SEC and thro Electronic copies of these reports can be accessed at the SEC's website (*http://www.sec.gov*) and indirectly through Berkshire's *www.berkshirehathaway.com*). Copies of these reports may also be obtained, free of charge, upon written request to: Berkshire Hat Farnam Street, Omaha, NE 68131, Attn: Corporate Secretary. The public may read or obtain copies of these reports from the SEC a Reference Room at 450 Fifth Street N.W., Washington, D.C. 20549 (1-800-SEC-0330).

Item 1A. Risk Factors

Berkshire and its subsidiaries (referred to herein as "we," "us," "our" or similar expressions) are subject to certain risks and business operations which are described below. The risks and uncertainties described below are not the only risks we face. Addit uncertainties that are presently unknown or are currently deemed immaterial may also impair our business operatio

We are dependent on a few key people for our major investment and capital allocation decisions.

Major investment decisions and all major capital allocation decisions are made by Warren E. Buffett, Chairman of the Boar Chief Executive Officer, age 87, in consultation with Charles T. Munger, Vice Chairman of the Board of Directors, age 94. If for any of our key personnel, particularly Mr. Buffett, were to become unavailable, there could be a material adverse effect on our operat Berkshire's Board of Directors has identified certain current Berkshire subsidiary managers who, in their judgment, are capable Mr. Buffett and has agreed on a replacement for Mr. Buffett should a replacement be needed currently. The Board continually mon could alter its current view regarding a replacement for Mr. Buffett in the future. We believe that the Board's succession plan, to outstanding managers running our numerous and highly diversified operating units helps to mitigate this risk.

We need qualified personnel to manage and operate our various businesses.

In our decentralized business model, we need qualified and competent management to direct day-to-day business activities subsidiaries and to manage changes in future business operations due to changing business or regulatory environments. Our operatin need qualified and competent personnel in executing their business plans and serving their customers, suppliers and other stakeholde recruit and retain qualified and competent managers and personnel could negatively affect the operating results, financial condition a subsidiaries and Berkshire as a whole.

The past growth rate in Berkshire's book value per share is not an indication of future results.

In the years since present management acquired control of Berkshire, our book value per share has grown at a highly satisfac of the large size of our capital base (Berkshire shareholders' equity was approximately $348 billion as of December 31, 2017), our bo will very likely *not* increase in the future at a rate close to its past rate.

Investments are unusually concentrated and fair values are subject to loss in value.

We concentrate a high percentage of the investments of our insurance subsidiaries in a relatively small number of equity secu our investment portfolios far less than is conventional in the insurance industry. A significant decline in the fair values of our larger produce a material decline in our consolidated shareholders' equity and our consolidated book value per share. Beginning in 2018, al values of equity securities (whether realized or unrealized) will be recognized as gains or losses in our consolidated statement of earn significant declines in the fair values of these securities will produce significant declines in our reported earnings.

Since a large percentage of our equity securities are held by our insurance subsidiaries, significant decreases in the fair v investments will produce significant declines in statutory surplus. Our large statutory surplus is a competitive advantage, and a mate have a materially adverse effect on our claims-paying ability ratings and our ability to write new insurance business thus potentially r underwriting profits.

Competition and technology may erode our business franchises and result in lower earnings.

Each of our operating businesses face intense competitive pressures within markets in which they operate. While we manage the objective of achieving long-term sustainable growth by developing and strengthening competitive advantages, many factors, inc technology changes, may erode or prevent the strengthening of competitive advantages. Accordingly, future operating results will degree on whether our operating units are successful in protecting or enhancing their competitive advantages. If our operating b unsuccessful in these efforts, our periodic operating results in the future may decline.

Deterioration of general economic conditions may significantly reduce our operating earnings and impair our ability to acces at a reasonable cost.

Our operating businesses are subject to normal economic cycles affecting the economy in general or the industries in which t extent that the economy deteriorates for a prolonged period of time, one or more of our significant operations could be materially ha our utilities and energy businesses and our railroad business regularly utilize debt as a component of their capital structures. These bu having access to borrowed funds through the capital markets at reasonable rates. To the extent that access to the capital markets is re of funding increases, these operations could be adversely affected.

Terrorist acts could hurt our operating businesses.

A successful (as defined by the aggressor) cyber, biological, nuclear or chemical attack could produce significant losses to operations. Our business operations could be adversely affected directly through the loss of human resources or destruction of produ information systems. This is a risk that we share with all businesses.

Regulatory changes may adversely impact our future operating results.

In recent years, partially in response to financial markets crises, global economic recessions, and social and environmental initiatives have accelerated in the United States and abroad. Such initiatives address for example, the regulation of banks and othe institutions, environmental and global-warming matters and health care reform. These initiatives impact not only our regulated insu railroad transportation businesses, but also our manufacturing, services, retailing and financing businesses. Increased regulatory com have a significant negative impact on our operating businesses, as well as on the businesses in which we have a significant but not co interest. We cannot predict whether such initiatives will have a material adverse impact on our consolidated financial position, resul cash flows.

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Cyber security risks

We rely on information technology in virtually all aspects of our business. Like those of many large businesses, certain of technology systems have been subject to computer viruses, malicious codes, unauthorized access, phishing efforts, denial-of-service cyber attacks and we expect to be subject to similar attacks in the future as such attacks become more sophisticated and frequent disruption or failure of our information technology systems could result in service interruptions, safety failures, security violatio compliance failures, an inability to protect information and assets against intruders, and other operational difficulties. Attacks perpe information systems could result in loss of assets and critical information and expose us to remediation costs and reputationa

Although we have taken steps intended to mitigate these risks, including business continuity planning, disaster recovery plan impact analysis, a significant disruption or cyber intrusion could lead to misappropriation of assets or data corruption and could ad results of operations, financial condition and liquidity. Additionally, if we are unable to acquire, implement or protect rights around n may suffer a competitive disadvantage, which could also have an adverse effect on our results of operations, financial condition

Cyber attacks could further adversely affect our ability to operate facilities, information technology and business systems, confidential customer and employee information. Political, economic, social or financial market instability or damage to or interf operating assets, customers or suppliers may result in business interruptions, lost revenues, higher commodity prices, disruption in f energy consumption, unstable markets, increased security, repair or other costs, may materially adversely affect us in ways that cann this time. Any of these risks could materially affect our consolidated financial results. Furthermore, instability in the financial mark terrorism, sustained or significant cyber attacks, or war could also have a material adverse effect on our ability to raise capital. These with all businesses.

Derivative contracts may require significant cash settlement payments and result in significant losses in the fut

We have assumed the risk of potentially significant losses under equity index put option contracts. Although we received cons as compensation for accepting these risks, there is no assurance that the premiums we received will exceed our aggregate settlement losses under our equity index put option contracts are based on declines in equity prices of stocks comprising certain major stock in contracts expire beginning in 2018, we could be required to make significant payments if equity index prices are significantly below specified in the contracts.

Equity index put option contracts are recorded at fair value in our Consolidated Balance Sheet and the periodic changes in reported in earnings. Currently, the valuations of these contracts are primarily dependent on the related index values. Material decrea may result in material losses in periodic earnings.

Risks unique to our regulated businesses

Our tolerance for risk in our insurance businesses may result in significant underwriting losses.

When properly paid for the risk assumed, we have been and will continue to be willing to assume more risk from a single ev insurer has knowingly assumed. Accordingly, we could incur a significant loss from a single event. We may also write coverages for acts of terrorism. We attempt to take into account all possible correlations and avoid writing groups of policies from which pre-ta aggregate above $10 billion. Currently, we estimate that our aggregate exposure from a single event under outstanding policies is si $10 billion. However, despite our efforts, losses may aggregate in unanticipated ways. Our tolerance for significant insurance losses reported earnings (or net losses) in a future period.

The degree of estimation error inherent in the process of estimating property and casualty insurance loss reserves may resu underwriting losses.

The principal cost associated with the property and casualty insurance business is claims. In writing property and casualty ins receive premiums today and promise to pay covered losses in the future. However, it will take decades before all claims that have o given balance sheet date will be reported and settled. Although we believe that liabilities for unpaid losses are adequate, we will not k liabilities or the premiums charged for the coverages provided were sufficient until well after the balance sheet date. Estimating insur inherently imprecise. Our estimated unpaid losses arising under contracts covering property and casualty insurance risks are large December 31, 2017) so even small percentage increases to the aggregate liability estimate can result in materially lower future po earnings.

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Changes in regulations and regulatory actions can adversely affect our operating results and our ability to allocate

Our insurance businesses are subject to regulation in the jurisdictions in which we operate. Such regulations may relate to ar the types of business that can be written, the rates that can be charged for coverage, the level of capital that must be maintained, and types and size of investments that can be made. Regulations may also restrict the timing and amount of dividend payments to Ber businesses. Accordingly, changes in regulations related to these or other matters or regulatory actions imposing restrictions on our in may adversely impact our results of operations and restrict our ability to allocate capital.

Our railroad business conducted through BNSF is also subject to a significant number of governmental laws and regulations v and practices, taxes, railroad operations and a variety of health, safety, labor, environmental and other matters. Failure to comply wi and regulations could have a material adverse effect on BNSF's business. Governments may change the legislative and/or regulatory which BNSF operates without providing any recourse for any adverse effects that the change may have on the business. For example enacted in 2008 and amended in 2015 mandates the implementation of positive train control technology by December 31, 2018, or track where inter-city and commuter passenger railroads operate and where toxic-by-inhalation ("TIH") hazardous materials are trans with legislative and regulatory changes may pose significant operating and implementation risks and require significant capital

BNSF derives significant amounts of revenue from the transportation of energy-related commodities, particularly coal. To changes in government policies limit or restrict the usage of coal as a source of fuel in generating electricity or alternate fuels, suc displace coal on a competitive basis, revenues and earnings could be adversely affected. As a common carrier, BNSF is also require chemicals and other hazardous materials. An accidental release of hazardous materials could expose BNSF to significant claims, los environmental remediation obligations. Changes in the regulation of the rail industry could negatively impact BNSF's ability to deter services and to make capital improvements to its rail network, resulting in an adverse effect on our results of operations, financial co

Our utilities and energy businesses operated under BHE are highly regulated by numerous federal, state, local and foreign authorities in the jurisdictions in which they operate. These laws and regulations are complex, dynamic and subject to new interpretat Regulations affect almost every aspect of our utilities and energy businesses. Regulations broadly apply and may limit managem independently make and implement decisions regarding numerous matters including acquiring businesses; constructing, acquiring operating assets; operating and maintaining generating facilities and transmission and distribution system assets; complying with p integrity and environmental requirements; setting rates charged to customers; establishing capital structures and issuing debt or e transacting between our domestic utilities and our other subsidiaries and affiliates; and paying dividends or similar distributions. Fail or reinterpretations of existing regulations and new legislation or regulations, such as those relating to air and water quality, rene standards, cyber security, emissions performance standards, climate change, coal combustion byproduct disposal, hazardous and sol protected species and other environmental matters, or changes in the nature of the regulatory process may have a significant adver financial results.

Our railroad business requires significant ongoing capital investment to improve and maintain its railroad network so that tra can be safely and reliably provided to customers on a timely basis. Our utilities and energy businesses also require significant amo construct, operate and maintain generation, transmission and distribution systems to meet their customers' needs and reliability crit system assets may need to be operational for long periods of time in order to justify the financial investment. The risk of operational of capital projects is not necessarily recoverable through rates that are charged to customers. Further, a significant portion of co improvements are funded through debt issued by BNSF and BHE and their subsidiaries. Disruptions in debt capital markets that r funding when needed could adversely affect the results of operations, liquidity and capital resources of these business

Item 1B. Unresolved Staff Comments

None.

Item 2. Description of Properties

The properties used by Berkshire's business segments are summarized in this section. Berkshire's railroad and utilities and en particular, utilize considerable physical assets in their businesses.

Railroad Business—Burlington Northern Santa Fe

Through BNSF Railway, BNSF operates approximately 32,500 route miles of track (excluding multiple main tracks, yard tra 28 states, and also operates in three Canadian provinces. BNSF owns over 23,000 route miles, including easements, and operates ove of trackage rights that permit BNSF to operate its trains with its crews over other railroads' tracks. The total BNSF system, including main tracks, yard tracks and sidings, consists of over 50,000 operated miles of track, all of which are owned by or held under easeme for over 10,000 miles operated under trackage rights.

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BNSF operates various facilities and equipment to support its transportation system, including its infrastructure, locomotives also owns or leases other equipment to support rail operations, such as vehicles. Support facilities for rail operations include yard throughout its rail network, system locomotive shops to perform locomotive servicing and maintenance, a centralized network operat dispatching and network operations monitoring and management in Fort Worth, Texas, regional dispatching centers, computers, tel equipment, signal systems and other support systems. Transfer facilities are maintained for rail-to-rail as well as intermodal transf trailers and other freight traffic and include approximately 25 intermodal hubs located across the system. BNSF owns or holds und leases exceeding one year approximately 8,000 locomotives and 71,000 freight cars, in addition to maintenance of way and oth

In the ordinary course of business, BNSF makes significant capital investments to expand and improve its railroad networ significant costs in repairing and maintaining its properties. In 2017, BNSF recorded approximately $2 billion in repairs and main

Utilities and Energy Businesses—Berkshire Hathaway Energy

BHE's energy properties consist of the physical assets necessary to support its electricity and natural gas businesses. Prop electricity businesses include electric generation, transmission and distribution facilities, as well as coal mining assets that support electric generating facilities. Properties of BHE's natural gas businesses include natural gas distribution facilities, interstate pipelines compressor stations and meter stations. The transmission and distribution assets are primarily within each of BHE's utility service ter to these physical assets, BHE has rights-of-way, mineral rights and water rights that enable BHE to utilize its facilities. Pursuant to agreements, a majority of these properties are pledged or encumbered to support or otherwise provide the security for the related sub or its affiliates own or have interests in the following types of electric generating facilities at December 31, 2017:

Energy Source	Entity	Location by Significance
Natural gas	PacifiCorp, MEC, NV Energy and BHE Renewables	Nevada, Utah, Iowa, Illinois, Washington, Oregon, Texas, New York, and Arizona
Coal	PacifiCorp, MEC and NV Energy	Wyoming, Iowa, Utah, Arizona, Nevada, Colorado and Montana
Wind	PacifiCorp, MEC and BHE Renewables	Iowa, Wyoming, Nebraska, Washington, California, Texas, Oregon, Illinois and Kansas
Solar	BHE Renewables and NV Energy	California, Texas, Arizona, Minnesota and Nevada
Hydroelectric	PacifiCorp, MEC and BHE Renewables	Washington, Oregon, The Philippines, Idaho, California, Utah, Hawaii, Montana, Illinois and Wyoming
Nuclear	MEC	Illinois
Geothermal	PacifiCorp and BHE Renewables	California and Utah
		Total

(1) *Facility Net Capacity (MW) represents the lesser of nominal ratings or any limitations under applicable interconnection, power agreements for intermittent resources and the total net dependable capability available during summer conditions for all other un resource's nominal rating is the manufacturer's contractually specified capability (in MW) under specified conditions. Net Owned BHE's ownership of Facility Net Capacity.*

As of December 31, 2017, BHE's subsidiaries also have electric generating facilities that are under construction in Iowa, Illin having total Facility Net Capacity and Net Owned Capacity of 1,902 MW.

PacifiCorp, MEC and NV Energy own electric transmission and distribution systems, including approximately 24,800 mile lines and approximately 1,690 substations, gas distribution facilities, including approximately 26,800 miles of gas mains and serv estimated 39 million tons of recoverable coal reserves in mines owned or leased in Wyoming and Colorado.

The electricity distribution network of Northern Powergrid (Northeast) and Northern Powergrid (Yorkshire) includes approxim of overhead lines, approximately 42,000 miles of underground cables and approximately 750 major substations. AltaLink's electri system includes approximately 8,100 miles of transmission lines and approximately 310 substations.

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Northern Natural’s pipeline system consists of approximately 14,700 miles of natural gas pipelines, including approximate mainline transmission pipelines and approximately 8,400 miles of branch and lateral pipelines. Northern Natural’s end-use and distri includes points in Iowa, Nebraska, Minnesota, Wisconsin, South Dakota, Michigan and Illinois and its natural gas supply and deli includes points in Kansas, Texas, Oklahoma and New Mexico. Storage services are provided through the operation of one undergr storage field in Iowa, two underground natural gas storage facilities in Kansas and two liquefied natural gas storage peaking units, o in Minnesota.

Kern River’s system consists of approximately 1,700 miles of natural gas pipelines, including approximately 1,400 miles of including 100 miles of lateral pipelines, and approximately 300 miles of common facilities. Kern River owns the entire mainline sect from the system’s point of origination in Wyoming through the Central Rocky Mountains into California.

Other Segments

The physical properties used by Berkshire’s other significant business segments are summarized below:

Business	Country	Location	Type of Property/Facility	Number of Properties
Insurance:				
GEICO	U.S.	Chevy Chase, MD and 5 other states	Offices	12
		Various locations in 38 states	Offices	108
Berkshire Hathaway Reinsurance Group	U.S.	Stamford, CT	Offices	1
		Various locations	Offices	31
	Non-U.S.	Cologne, Germany	Offices	1
		Various locations in 22 countries	Offices	35
Berkshire Hathaway Primary Group	U.S.	Omaha, NE, Fort Wayne, IN, Princeton, NJ, Wilkes-Barre, PA and Oklahoma City, OK	Offices	7
		Various locations in 23 states	Offices	74
	Non-U.S	Locations in 7 countries	Offices	10
Manufacturing	U.S.	Various locations	Manufacturing plants Manufacturing plants Offices/Warehouses Offices/Warehouses Retail/Showroom Retail/Showroom	481 143 223 403 16 49
	Non-U.S.	Various locations in over 60 countries	Manufacturing plants Manufacturing plants Offices/Warehouses Offices/Warehouses Retail/Showroom	202 132 78 526 5

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Business	Country	Location	Type of Property/Facility	Number of Properties	Owned/ Leased
Service	U.S.	Various locations	Training facilities/Hangars	19	Owned
			Training facilities/Hangars	130	Leased
			Offices/Distribution	56	Owned
			Offices/Distribution	159	Leased
			Production facilities	26	Owned
			Production facilities	3	Leased
	Non-U.S.	Various locations in 33 countries	Offices/Distribution/ Hangars/Training facilities	19	Owned
			Offices/Distribution/ Hangars/Training facilities	129	Leased
McLane Company	U.S.	Various locations	Distribution centers/Offices	54	Owned
			Distribution centers/Offices	33	Leased
Retailing	U.S.	Various locations	Offices/Warehouses/Plants	29	Owned
			Offices/Warehouses	27	Leased
			Retail/Showroom	143	Owned
			Retail/Showroom	546	Leased
	Non-U.S.	Germany	Office/Warehouse	1	Owned
		Locations in 6 countries	Retail/Offices	97	Leased
Finance & Financial Products	U.S.	Various locations	Manufacturing plants	67	Owned
			Manufacturing plants	6	Leased
			Offices/Warehouses	22	Owned
			Offices/Warehouses	73	Leased
			Leasing/Showroom/Retail	234	Owned
			Leasing/Showroom/Retail	255	Leased
			Housing communities	118	Owned
	Non-U.S.	Various locations in 12 countries	Manufacturing plants	22	Owned
			Manufacturing plants	32	Leased
			Offices/Warehouses	3	Owned
			Offices/Warehouses	25	Leased

Item 3. Legal Proceedings

Berkshire and its subsidiaries are parties in a variety of legal actions that routinely arise out of the normal course of busines actions seeking to establish liability directly through insurance contracts or indirectly through reinsurance contracts issued by Berk Plaintiffs occasionally seek punitive or exemplary damages. We do not believe that such normal and routine litigation will have a ma financial condition or results of operations. Berkshire and certain of its subsidiaries are also involved in other kinds of legal action assert or may assert claims or seek to impose fines and penalties. We believe that any liability that may arise as a result of other pen will not have a material effect on our consolidated financial condition or results of operations.

Item 4. Mine Safety Disclosures

Information regarding the Company's mine safety violations and other legal matters disclosed in accordance with Section 15 Frank Reform Act is included in Exhibit 95 to this Form 10-K.

Executive Officers of the Registrant

Following is a list of the Registrant's named executive officers:

Name	Age	Position with Registrant	Since
Warren E. Buffett	87	Chairman and Chief Executive Officer	1970
Charles T. Munger	94	Vice Chairman	1978
Gregory E. Abel	55	Vice Chairman – Non-Insurance Operations	2018
Ajit Jain	66	Vice Chairman – Insurance Operations	2018
Marc D. Hamburg	68	Senior Vice-President – Chief Financial Officer	1992

Each executive officer serves, in accordance with the by-laws of the Registrant, until the first meeting of the Board of Direc next annual meeting of shareholders and until a successor is chosen and qualified or until such executive officer sooner dies, resig becomes disqualified.

FORWARD-LOOKING STATEMENTS

Investors are cautioned that certain statements contained in this document as well as some statements in periodic press oral statements of Berkshire officials during presentations about Berkshire or its subsidiaries are "forward-looking" statements withi Private Securities Litigation Reform Act of 1995 (the "Act"). Forward-looking statements include statements which are predictive depend upon or refer to future events or conditions, which include words such as "expects," "anticipates," "intends," "plans," "belie similar expressions. In addition, any statements concerning future financial performance (including future revenues, earnings or gro business strategies or prospects and possible future Berkshire actions, which may be provided by management, are also forward-loo defined by the Act. Forward-looking statements are based on current expectations and projections about future events and are s uncertainties and assumptions about Berkshire and its subsidiaries, economic and market factors and the industries in which we do other things. These statements are not guarantees of future performance and we have no specific intention to update these s

Actual events and results may differ materially from those expressed or forecasted in forward-looking statements du factors. The principal risk factors that could cause our actual performance and future events and actions to differ materially from su statements include, but are not limited to, changes in market prices of our investments in fixed maturity and equity securities, loss derivative contracts, the occurrence of one or more catastrophic events, such as an earthquake, hurricane, act of terrorism or cyber losses insured by our insurance subsidiaries and/or losses to our business operations, changes in laws or regulations affecting our in utilities and energy and finance subsidiaries, changes in federal income tax laws, and changes in general economic and market fact prices of securities or the industries in which we do business.

Part II

Item 5. Market for Registrant’s Common Equity, Related Security Holder Matters and Issuer Purchases of Equity Securities

Market Information

Berkshire’s Class A and Class B common stock are listed for trading on the New York Stock Exchange, trading symbol: BRK following table sets forth the high and low sales prices per share, as reported on the New York Stock Exchange Composite List du indicated:

	2017				2016			
	Class A		Class B		Class A		Class B	
	High	Low	High	Low	High	Low	High	Low
First Quarter	$ 266,445	$ 237,983	$ 177.86	$ 158.61	$ 215,130	$ 186,900	$ 143.40	$ 123.55
Second Quarter	257,944	242,180	171.95	160.93	221,985	205,074	148.03	136.65
Third Quarter	275,945	252,254	184.00	168.00	226,490	211,500	151.05	140.95
Fourth Quarter	301,000	270,250	200.50	180.44	250,786	213,030	167.25	141.92

Shareholders

Berkshire had approximately 2,100 record holders of its Class A common stock and 19,800 record holders of its Class B c February 12, 2018. Record owners included nominees holding at least 410,000 shares of Class A common stock and 1,339,000,000 common stock on behalf of beneficial-but-not-of-record owners.

Dividends

Berkshire has not declared a cash dividend since 1967.

Common Stock Repurchase Program

Berkshire’s Board of Directors has approved a common stock repurchase program permitting Berkshire to repurchase its Cl shares at prices no higher than a 20% premium over the book value of the shares. The program allows share repurchases in the open privately negotiated transactions and does not specify a maximum number of shares to be repurchased. There were no share repur program in 2017.

Stock Performance Graph

The following chart compares the subsequent value of $100 invested in Berkshire common stock on December 31, 2012 investment in the Standard & Poor’s 500 Stock Index and in the Standard & Poor’s Property – Casualty Insurance Inde

LOGO

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* *Cumulative return for the Standard & Poor’s indices based on reinvestment of dividends.*

** *It would be difficult to develop a peer group of companies similar to Berkshire. The Corporation owns subsidiaries engaged in a business activities of which the most important is the property and casualty insurance business and, accordingly, management has & Poor’s Property—Casualty Insurance Index for comparative purposes.*

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Item 6. Selected Financial Data

Selected Financial Data for the Past Five Years
(dollars in millions except per-share data)

	2017	2016	2015	201
Revenues:				
Insurance premiums earned	$ 60,597	$ 45,881	$ 41,294	$ 41,2
Sales and service revenues	125,963	119,489	107,001	97,0
Railroad, utilities and energy revenues	39,943	37,542	40,004	40,6
Interest, dividend and other investment income	5,144	4,725	5,357	5,0
Finance and financial products sales and service revenues and interest and dividend income	8,362	7,663	6,940	6,5
Investment and derivative gains/losses	2,128	8,304	10,347	4,0
Total revenues	$ 242,137	$ 223,604	$ 210,943	$ 194,
Earnings:				
Net earnings attributable to Berkshire Hathaway *(1)*	$ 44,940	$ 24,074	$ 24,083	$ 19,8
Net earnings per share attributable to Berkshire Hathaway shareholders *(2)*	$ 27,326	$ 14,645	$ 14,656	$ 12,0
Year-end data:				
Total assets	$ 702,095	$ 620,854	$ 552,257	$ 525,
Notes payable and other borrowings:				
Insurance and other	27,324	27,175	14,599	11,8
Railroad, utilities and energy	62,178	59,085	57,739	55,3
Finance and financial products	13,085	15,384	11,951	12,7
Berkshire Hathaway shareholders' equity *(3)*	348,296	282,070	254,619	239,
Class A equivalent common shares outstanding, in thousands	1,645	1,644	1,643	1,6
Berkshire Hathaway shareholders' equity per outstanding Class A equivalent common share *(3)*	$ 211,750	$ 171,542	$ 154,935	$ 145,

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(1) *Includes after-tax investment and derivative gains/losses of $1.4 billion in 2017, $6.5 billion in 2016, $6.7 billion in 2015, $3.3 $4.3 billion in 2013. Net earnings in 2017 includes a one-time net benefit of $29.1 billion attributable to the enactment of the Ta of 2017.*

(2) *Represents net earnings per average equivalent Class A share outstanding. Net earnings per average equivalent Class B commo is equal to 1/1,500 of such amount.*

(3) *Beginning in 2017, discounting of certain workers' compensation claim liabilities for financial reporting purposes was disconti the change was immaterial to the Consolidated Statements of Earnings from 2013 through 2016, and such amounts were not res net discount as of December 31, 2016 of $931 million was charged to retained earnings as of the earliest period presented shareholders' equity and shareholders' equity per Class A equivalent common share for the years 2013-2016 have been restate previously reported.*

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Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

Results of Operations

Net earnings attributable to Berkshire Hathaway shareholders for each of the past three years are disaggregated in the tal
Amounts are after deducting income taxes and exclude earnings attributable to noncontrolling interests (in millions

	2017	2016	2015
Insurance – underwriting	$ (2,219)	$ 1,370	$ 1,162
Insurance – investment income	3,917	3,636	3,725
Railroad	3,959	3,569	4,248
Utilities and energy	2,083	2,287	2,132
Manufacturing, service and retailing	6,208	5,631	4,683
Finance and financial products	1,335	1,427	1,378
Investment and derivative gains/losses	1,377	6,497	6,725
Other	(826)	(343)	30
Tax Cuts and Jobs Act of 2017	29,106	—	—
Net earnings attributable to Berkshire Hathaway shareholders	$ 44,940	$ 24,074	$ 24,083

Through our subsidiaries, we engage in a number of diverse business activities. We manage our operating businesses o decentralized basis. There are essentially no centralized or integrated business functions and there is minimal involvement by our cor in the day-to-day business activities of the operating businesses. Our senior corporate management team participates in and is ultima significant capital allocation decisions, investment activities and the selection of the Chief Executive to head each of the operating b responsible for establishing and monitoring Berkshire's corporate governance practices. The business segment data (Note 23 to th Consolidated Financial Statements) should be read in conjunction with this discussion.

Our net earnings in 2017 included approximately $29.1 billion attributable to a one-time net benefit from the enactment o Jobs Act ("TCJA") on December 22, 2017. See Note 16 to the Consolidated Financial Statements. This benefit included approxima related to a one-time non-cash reduction of our net deferred income tax liabilities that arose from the reduction in the statutory U.S. tax rate from 35% to 21%, as well as a net benefit of approximately $900 million primarily from our earnings from Kraft Heinz, p one-time income tax expense of approximately $1.4 billion payable over eight years on the deemed repatriation of certain accumula earnings of foreign subsidiaries. Due to their significance, we presented these one-time effects as a distinct item in the preceding tabl after-tax figures presented in the discussion of our various operating businesses and other activities in this section exclude the one-t TCJA.

Our insurance businesses generated after-tax losses from underwriting of $2.2 billion in 2017 compared to after-tax gains 2016 and $1.2 billion in 2015. Underwriting results for 2017 included estimated pre-tax losses of approximately $3.0 billion ($1.95 primarily attributable to three major hurricanes in the U.S. and Puerto Rico and wildfires in California. Underwriting results in each after-tax foreign currency exchange rate gains and losses from the revaluation of certain non-U.S. Dollar denominated reinsurance l such after-tax losses were $295 million compared to after-tax gains of $458 million in 2016 and $164 million in 201

After-tax earnings of our railroad business in 2017 were $4.0 billion, an increase of 10.9% compared to 2016, reflecting inc Our railroad business generated lower net earnings in 2016 compared to 2015, primarily due to a 5.0% decline in unit volume. After- utility and energy business in 2017 declined $204 million compared to 2016. Earnings in 2017 were negatively affected by losses fr of certain long-term debt. After-tax earnings of our utilities and energy businesses increased in 2016 compared to 2015, attributable t earnings and a lower effective income tax rate.

After-tax earnings of our manufacturing, service and retailing businesses in 2017 were $6.2 billion, an increase of 10.2% c Earnings in 2017 reflected comparatively higher earnings from several of our larger operations and the impact of businesses acquire After-tax earnings in 2016 of our manufacturing, service and retailing businesses increased compared to 2015, primarily due to earni Castparts, which was acquired on January 29, 2016, partly offset by comparatively lower overall earnings from the other businesses

Management's Discussion and Analysis *(Continued)*

Results of Operations *(Continued)*

After-tax investment and derivative gains were approximately $1.4 billion in 2017, $6.5 billion in 2016 and $6.7 billion in 2016 included approximately $2.7 billion from the redemptions of our Wrigley and Kraft Heinz preferred stock investments, sales common stock that we received upon conversion of our Dow Chemical preferred stock investment and a non-cash gain of approxin related to the exchange of Procter & Gamble ("P&G") common stock for 100% of the common stock of Duracell. Gains in 2015 ir holding gains of approximately $4.4 billion in connection with our investment in Kraft Heinz common stock.

After-tax unrealized gains in 2017 related to our investments in equity securities included in other comprehensive income v $19 billion. Beginning in 2018, unrealized gains and losses on equity securities will be included in net earnings due to a new accour believe that investment and derivative gains/losses, whether realized from sales or unrealized from changes in market prices, are oft terms of understanding our reported results or evaluating our periodic economic performance. Investment and derivative gains and l and will continue to cause significant volatility in our earnings.

Other earnings in 2017 and 2016 included after-tax foreign currency exchange rate gains and losses related to parent c denominated debt. After-tax foreign exchange losses on our Euro-denominated debt were $655 million in 2017 compared to aft $159 million in 2016. In addition, other earnings includes earnings from our investment in Kraft Heinz.

Insurance—Underwriting

We engage in both primary insurance and reinsurance of property/casualty, life and health risks. In primary insurance acti defined portions of the risks of loss from persons or organizations that are directly subject to the risks. In reinsurance activities, we portions of similar or dissimilar risks that other insurers or reinsurers have subjected themselves to in their own insuring activities. reinsurance businesses are GEICO, Berkshire Hathaway Reinsurance Group ("BHRG") and Berkshire Hathaway Primary

Our management views insurance businesses as possessing two distinct operations – underwriting and investing. Underwr the responsibility of the unit managers, while investing decisions are the responsibility of Berkshire's Chairman and CEO, Warre Berkshire's corporate investment managers. Accordingly, we evaluate performance of underwriting operations without any allocati income or investment gains/losses. We consider investment income as a component of our aggregate insurance operating results. Ho investment gains and losses, whether realized or unrealized as non-operating, based on our long-held philosophy of acquiring secu those securities for long periods. Accordingly, we believe that such gains and losses are not predictable or necessarily meaningful in operating results of our insurance operations.

The timing and amount of catastrophe losses can produce significant volatility in our periodic underwriting results, particul our reinsurance businesses. Generally, we consider pre-tax catastrophe losses in excess of $100 million from a current year event as had six such events in 2017. There were no significant events in either 2016 or 2015. Changes in estimates for unpaid losses and expenses, including amounts established for occurrences in prior years can also significantly affect our periodic underwriting resu estimates, including estimates under retroactive reinsurance contracts as of December 31, 2017 were approximately $104 billion. The revised upward or downward in future periods, which could produce significant decreases or increases to pre-tax earnings. Our peri results may also include significant foreign currency transaction gains and losses arising from the changes in the valuation of no denominated reinsurance liabilities of our U.S. based insurance subsidiaries due to foreign currency exchange rate fluctuations. F exchange rates can be volatile and the resulting impact on our underwriting earnings can be relatively significant.

Underwriting results of our insurance businesses are summarized below (in millions).

	2017	2016	2015
Underwriting gain (loss):			
GEICO	$ (310)	$ 462	$ 460
Berkshire Hathaway Reinsurance Group	(3,648)	1,012	553
Berkshire Hathaway Primary Group	719	657	824
Pre-tax underwriting gain (loss)	(3,239)	2,131	1,837
Income taxes and noncontrolling interests	(1,020)	761	675
Net underwriting gain (loss)	$ (2,219)	$ 1,370	$ 1,162

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Management's Discussion and Analysis *(Continued)*

Insurance—Underwriting *(Continued)*

GEICO

GEICO writes private passenger automobile insurance, offering coverages to insureds in all 50 states and the District of C markets its policies mainly by direct response methods where most customers apply for coverage directly to the company via the In telephone. A summary of GEICO's underwriting results follows (dollars in millions).

	2017		2016		2015	
	Amount	**%**	**Amount**	**%**	**Amount**	**%**
Premiums written	$ 30,547		$ 26,309		$ 23,378	
Premiums earned	$ 29,441	100.0	$ 25,483	100.0	$ 22,718	100.0
Losses and loss adjustment expenses	25,497	86.6	21,044	82.6	18,647	82.1
Underwriting expenses	4,254	14.5	3,977	15.6	3,611	15.9
Total losses and expenses	29,751	101.1	25,021	98.2	22,258	98.0
Pre-tax underwriting gain (loss)	$ (310)		$ 462		$ 460	

Premiums written in 2017 were $30.5 billion, an increase of 16.1% compared to 2016. Premiums earned in 2017 were $29.4 2016 by approximately $4.0 billion (15.5%). During 2017, our voluntary auto policies-in-force grew approximately 8.6% and premiu increased 6.9%. The increase in average premiums per policy was attributable to rate increases, coverage changes and changes in s Voluntary auto new business sales in 2017 increased 10.5% compared to 2016. Voluntary auto policies-in-force increased approxin during 2017.

We incurred pre-tax underwriting losses in 2017, which included approximately $450 million from hurricanes Harvey underwriting results in 2017 were also affected by increased average claims severities. Losses and loss adjustment expenses in 2017 an increase of approximately $4.5 billion (21.2%) compared to 2016. Our loss ratio (the ratio of losses and loss adjustment expe premiums) in 2017 increased 4.0 percentage points compared to 2016. Average claims severities were higher in 2017 for property da coverages (four to six percent range) and bodily injury coverage (five to seven percent range). Claims frequencies in 2017 were rela compared to 2016 for bodily injury coverage, decreased about one percent for property damage and collision coverages and decrease percent for personal injury protection coverage. Losses and loss adjustment expenses in 2017 also included pre-tax losses of $517 re-estimation of liabilities for prior years' claims compared to pre-tax gains of $61 million in 2016 and $150 million in

Underwriting expenses increased $277 million (7.0%) compared to 2016. Our expense ratios (underwriting expenses to pre 2017 declined 1.1 percentage points compared to 2016. The largest components of underwriting expenses are employee-related (sal and advertising, which increased at lower rates than premiums earned.

Premiums written in 2016 increased 12.5% to $26.3 billion and premiums earned increased approximately $2.8 billio $25.5 billion, compared to 2015. These increases reflected voluntary auto policies-in-force growth of 7% and increased average pr policy. Voluntary auto new business sales in 2016 increased 10.9% compared to the prior year. Voluntary auto new business growth a last half of 2016 and, for the year, voluntary auto policies-in-force increased 974,000.

Losses and loss adjustment expenses incurred in 2016 increased $2.4 billion (12.9%) to $21.0 billion and our loss ratio in 2 percentage points compared to 2015. In 2016, we experienced increases in storm losses (primarily from hail and flooding) and clain offset by the effects of premium rate increases. Claims frequencies in 2016 were relatively unchanged from 2015 for property damag injury and personal injury protection coverages. Average claims severities were higher in 2016 for bodily injury, physical damag coverages (four to six percent range). Underwriting expenses in 2016 were $4.0 billion, an increase of $366 million (10.1%) over 20 underwriting expenses in 2016 reflected the increase in policies-in-force.

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Insurance—Underwriting *(Continued)*

Berkshire Hathaway Reinsurance Group

We offer excess-of-loss and quota-share reinsurance coverages on property and casualty risks and life and health reinsuran reinsurers worldwide through several legal entities, led by National Indemnity Company ("NICO Group"), Berkshire Hathaway Company of Nebraska ("BHLN Group"), and General Reinsurance Corporation, General Reinsurance AG and General Re Life (collectively, "General Re Group"). We also periodically assume property and casualty risks under retroactive reinsurance contract NICO. In addition, the BHLN Group writes periodic payment annuity contracts.

With the exception of our retroactive reinsurance and periodic payment annuity businesses, we strive to generate pre-tax und all product lines. Time-value-of-money concepts are important elements in establishing prices for our retroactive reinsurance and p annuity businesses due to the expected long durations of the liabilities. We expect to incur pre-tax underwriting losses from such bus through deferred charge amortization and discount accretion charges. Premiums received at inception under these contracts are ofte then available for investment. A summary of the premiums and pre-tax underwriting results of our reinsurers follows (in m

	Premiums written			Premiums earned			Pre-tax underwriting gain (loss)		
	2017	2016	2015	2017	2016	2015	2017	2016	2015
Property/casualty	$ 7,713	$ 6,993	$ 7,427	$ 7,552	$ 7,218	$ 7,221	$ (1,595)	$ 895	$ 1,095
Retroactive reinsurance	10,755	1,254	5	10,755	1,254	5	(1,330)	(60)	(470)
	18,468	8,247	7,432	18,307	8,472	7,226	(2,925)	835	625
Life/health	4,846	4,588	4,665	4,808	4,587	4,670	(52)	305	130
Periodic payment annuity	898	1,082	1,286	898	1,082	1,286	(671)	(128)	(202)
	5,744	5,670	5,951	5,706	5,669	5,956	(723)	177	(72)
	$ 24,212	$ 13,917	$ 13,383	$ 24,013	$ 14,141	$ 13,182	$ (3,648)	$ 1,012	$ 553

Property/casualty

A summary of premiums and underwriting results of our property/casualty reinsurance businesses follows (in m

	Premiums written			Premiums earned			Pre-tax underwriting gain (loss)		
	2017	2016	2015	2017	2016	2015	2017	2016	2015
NICO Group	$ 4,371	$ 4,433	$ 4,702	$ 4,451	$ 4,649	$ 4,416	$(1,044)	$ 767	$ 944
General Re Group	3,342	2,560	2,725	3,101	2,569	2,805	(551)	128	151
	$ 7,713	$ 6,993	$ 7,427	$ 7,552	$ 7,218	$ 7,221	$(1,595)	895	1,095

NICO Group's premiums earned were $4.4 billion, a decrease of $198 million (4%) in 2017 compared to 2016, while pr declined slightly. Roughly 40% of NICO Group's premiums written and earned in 2017 and 2016 derived from a 10-year, 20% quota Insurance Australia Group Ltd. ("IAG") that incepted in July 2015. General Re Group's premiums earned were $3.1 billion in 201 $532 million (21%) compared to 2016. The increase reflected higher written premiums in both direct and broker markets, derived p business and increased participations for renewal business. Industry capacity dedicated to property and casualty markets remains competition in most reinsurance markets persists. We continue to decline business when we believe prices are inadequ

On a combined basis, our property/casualty reinsurance business sustained pre-tax underwriting losses of $1.6 billion in 2 estimated losses of approximately $2.4 billion in 2017 from several significant catastrophe loss events occurring during the year inc Harvey, Irma and Maria, an earthquake in Mexico, a cyclone in Australia and wildfires in California. There were no significant catas in 2016 or 2015.

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On a combined basis, we also decreased estimated ultimate claims liabilities for prior years' loss events by $295 million in
$955 million in 2016. The comparative decline reflected higher than expected reported property claims and the effects of increases
Kingdom ("U.K.") claim liabilities attributable to the U.K. Ministry of Justice's decision in the first quarter of 2017 to reduce the fi
required in lump sum settlement calculations of U.K. personal injury claims, known as the Ogden rate, from 2.5% to negative 0.75%
subject to adjustment in the future at the discretion of the U.K. Government and significant changes in that rate may have a signific
claim liability estimates.

NICO Group's premiums earned in 2016 increased $233 million (5%) compared to 2015 reflecting the impact of the IAG qu
partly offset by declines from other business, while General Re Group's premiums earned declined $236 million (8%) versus 2015
General Re Group's premiums earned was primarily due to lower volume in direct and broker market business.

Our property/casualty reinsurers produced pre-tax underwriting gains of $895 million in 2016 and $1,095 million in 2015
basis, we decreased estimated ultimate claims liabilities for prior years' loss events by $955 million in 2016 and $1.2 billion in 2015
were primarily attributable to lower than expected reported losses from ceding companies with respect to property coverages. Pre-
results in 2016 and 2015 included discount accretion related to certain workers' compensation claim liabilities of $80 million in 2016
2015. There was no effect from discounting on 2017 results, as the practice of discounting these related liabilities was disconti

Retroactive reinsurance

Premiums earned in 2017 included $10.2 billion from an aggregate excess-of-loss retroactive reinsurance agreement with v
of American International Group, Inc. (the "AIG Agreement"). At the inception of the AIG Agreement, we also recorded losses and
expenses incurred of $10.2 billion, representing our initial estimate of the unpaid losses and loss adjustment expenses assumed of $
offset by an initial deferred charge asset of $6.2 billion. Thus, on the effective date, the AIG Agreement had no effect on our pre-t
results. In the fourth quarter of 2017, we increased our ultimate claim liability estimates related to the AIG Agreement by approxim
based on higher than expected loss payments being reported under the contractual retention, which affected our estimate of our li
increased the related deferred charge asset by $1.7 billion based on our re-estimation of the amount and timing of our recorde

Certain liabilities related to retroactive reinsurance contracts written by our U.S. subsidiaries are denominated in forei
Underwriting results included pre-tax losses of $264 million in 2017 and pre-tax gains of $392 million in 2016 and $150 million in 2
the re-measurement of such liabilities due to changes in foreign currency exchange rates, primarily related to the Great Britain Pound

Pre-tax underwriting losses before foreign currency gains/losses were $1,066 million in 2017, $452 million in 2016 and $6
derived from deferred charge amortization and changes in the timing and amount of ultimate losses. Pre-tax losses in 2017 increased
due to amortization charges related to new contracts, including the AIG Agreement, partly offset by lower amortization on prior y
Changes in estimated ultimate liabilities for prior years' contracts were relatively insignificant in 2017 and 2016. During 2015, we i
ultimate liabilities approximately $550 million for prior years' contracts. The increase in estimated ultimate liabilities, net of relate
adjustments, produced incremental pre-tax underwriting losses of approximately $90 million in 2015.

Gross unpaid losses assumed under retroactive reinsurance contracts were approximately $42.9 billion at December 31, 201
at December 31, 2016. Unamortized deferred charge assets related to such reinsurance contracts were approximately $15.3 billion at
and $8.0 billion at December 31, 2016. The increases in unpaid losses and deferred charges were predominantly attributable to the A
deferred charge asset balances will be amortized as charges to pre-tax earnings over the expected remaining claims settleme

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Life/health

Premiums earned and pre-tax underwriting results of our life/health reinsurance businesses are further summarized as foll

	Premiums earned			Pre-tax underwriting gain (loss)		
	2017	**2016**	**2015**	**2017**	**2016**	**2015**
General Re Group	$ 3,306	$ 3,068	$ 3,170	$ (369)	$ 73	$ (18)
BHLN Group	1,502	1,519	1,500	317	232	148
	$ 4,808	$ 4,587	$ 4,670	$ (52)	$ 305	$ 130

General Re Group's premiums earned increased $238 million (8%) in 2017 compared to 2016, which reflected growth ir Europe and Australia markets. Premiums earned declined $102 million (3%) in 2016 compared to 2015, primarily attributable to f translation effects and lower volume in Canada, partly offset by increased volume in the United Kingdom and Asia markets. Appro BHLN Group's premiums earned in each of the past three years was derived primarily from a single yearly renewable term life agre with a major reinsurer.

The General Re Group produced pre-tax underwriting losses of $369 million in 2017, gains of $73 million in 2016 and losse 2015. Pre-tax underwriting losses in 2017 included losses of approximately $450 million from the run-off of our U.S. long-term care discount rate reductions and changes in other actuarial assumptions in the fourth quarter, which increased our estimated benefit lia underwriting results reflected increased underwriting gains from our international life business, lower claim severity in North Americ from changes in actuarial assumptions related to the long-term care business as compared to 2015.

BHLN Group's pre-tax underwriting results included pre-tax gains of $256 million in 2017, $231 million in 2016 and $19 from the run-off of variable annuity business (reinsurance contracts that provide guarantees on closed blocks of variable annuity bu underwriting results from this business reflect changes in remaining liabilities for guaranteed benefits, resulting from changes in sec interest rates and from the periodic amortization of expected profit margins. Periodic underwriting results from these variable annuit volatile, reflecting the volatility of securities markets, interest rates and foreign currency exchange rates. Estimated liabilities for v guarantees were approximately $1.8 billion at December 31, 2017 and $2.1 billion at December 31, 2016. BHLN Group's life rein produced pre-tax gains of $61 million in 2017 and $1 million in 2016 and losses of $45 million in 2015.

Periodic payment annuity

Periodic payment annuity premiums earned declined $184 million (17%) in 2017 compared to 2016, due to lower volumes decreased $204 million (16%) in 2016 compared to 2015. Premiums earned in 2015 included $425 million from a single reinsur

Certain periodic payment annuity liabilities are denominated in foreign currencies, primarily the GBP. Underwriting result losses of $190 million in 2017 and pre-tax gains of $313 million in 2016 and $103 million in 2015 associated with the re-measureme due to changes in exchange rates.

Before foreign currency gains and losses, pre-tax underwriting losses from periodic payment annuity contracts were $481 $441 million in 2016 and $305 million in 2015. These losses were primarily attributable to the recurring discount accretion on new bu liabilities and the impact of lower interest rates in 2017 and 2016, which increased expected future loss payments under certain reins those years. Discounted annuity liabilities were approximately $11.2 billion at December 31, 2017 and $9.8 billion at December 31, 2 average annual discount rate for these liabilities was approximately 4.1% as of December 31, 2017.

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Berkshire Hathaway Primary Group

The Berkshire Hathaway Primary Group ("BH Primary") consists of a wide variety of independently managed insuranc businesses that primarily provide a variety of commercial insurance solutions, including healthcare malpractice, workers' compensa general liability, property and various specialty coverages for small, medium and large clients. The largest of these insurers include B Specialty Insurance ("BH Specialty"), Berkshire Hathaway Homestate Companies ("BHHC"), MedPro Group, Berkshire Hathaway Companies ("GUARD"), and National Indemnity Company ("NICO Primary"). Other BH Primary insurers include U.S. Liability In Applied Underwriters and Central States Indemnity Company. A summary of BH Primary underwriting results follows (dollars

	2017		2016		2015	
	Amount	%	Amount	%	Amount	%
Premiums written	$ 7,483		$ 6,684		$ 5,906	
Premiums earned	$ 7,143	100.0	$ 6,257	100.0	$ 5,394	100.0
Losses and loss adjustment expenses	4,511	63.1	3,864	61.8	3,070	56.9
Underwriting expenses	1,913	26.8	1,736	27.7	1,500	27.8
Total losses and expenses	6,424	89.9	5,600	89.5	4,570	84.7
Pre-tax underwriting gain	$ 719		$ 657		$ 824	

Premiums written in 2017 increased 12.0% compared to 2016. All of the significant BH Primary insurers generated incr written, led by GUARD (26%), BH Specialty (23%) and BHHC (9%). Premiums earned were $7.1 billion in 2017, an increase of $8 compared to 2016. BH Primary's premiums written and earned in 2016 increased 13.2% and 16.0%, respectively, compared to 2015. primarily attributable to volume increases from BH Specialty, MedPro Group, BHHC and GUARD.

BH Primary produced pre-tax underwriting gains of $719 million in 2017, $657 million in 2016 and $824 million in 201 overall loss ratios were 63.1% in 2017, 61.8% in 2016 and 56.9% in 2015. Losses and loss adjustment expenses in 2017 included $225 million (3% of premiums earned) related to the significant catastrophe events, primarily hurricanes Harvey and Irma. Losses a expenses also included net reductions of estimated ultimate liabilities for prior years' loss events of $766 million in 2017, $503 mi $643 million in 2015, which produced corresponding increases in pre-tax underwriting gains. The reductions of prior years' estima primarily related to healthcare malpractice and workers' compensation business. BH Primary writes significant levels of liability compensation business and the related claim costs may be subject to higher severity and longer claims-tails, which could contribu increases in claims liabilities in the future attributable to higher than expected claim settlements, adverse litigation or judicial ruling we have not anticipated.

Insurance—Investment Income

A summary of net investment income generated from investments held by our insurance operations follows (in m

	2017	2016	2015
Interest income	$ 1,310	$ 930	$ 888
Dividend income	3,592	3,552	3,662
Investment income before taxes and noncontrolling interests	4,902	4,482	4,550
Income taxes and noncontrolling interests	985	846	825
Net investment income	$ 3,917	$ 3,636	$ 3,725

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Insurance—Investment Income *(Continued)*

Pre-tax investment income increased $420 million (9%) in 2017 compared to 2016, attributable to an increase in interes
reflected higher interest rates on short-term investments and increased other investment income. Pre-tax investment income in 2
$68 million (1.5%) compared to 2015, reflecting lower dividend income attributable to portfolio changes, partly offset by an increase
We continue to hold significant amounts of cash and cash equivalents and U.S. Treasury Bills earning low yields. We believe that m
liquidity is paramount and we insist on safety over yield with respect to such balances.

Dividend income in 2017 was relatively unchanged compared to 2016 reflecting increased dividend rates and increased o
levels, offset by the impact of the conversion of our $3 billion investment in Dow Chemical Company ("Dow") 8.5% preferred stock
stock at the end of 2016. Prior to its conversion, we received dividends of $255 million per annum. In December 2017, RBI redeem
investment in 9% RBI Preferred stock investment, which will negatively affect investment income in 2018 when compared

Invested assets of our insurance businesses derive from shareholder capital, including reinvested earnings, and from net
insurance contracts or "float." The major components of float are unpaid losses and loss adjustment expenses, including liabilities
reinsurance contracts, life, annuity and health benefit liabilities, unearned premiums and other liabilities due to policyholders, les
reinsurance receivables, deferred charges assumed under retroactive reinsurance contracts and deferred policy acquisition costs. Fl
$114 billion at December 31, 2017 and $91 billion at December 31, 2016. The increase in float in 2017 reflected increases in unpa
adjustment expenses, including liabilities assumed under retroactive reinsurance contracts written in 2017 and estimated liabilities re
events, and overall growth of our insurance operations, partly offset by an increase in deferred charges on retroactive reinsurance con
underwriting losses were approximately $3.2 billion in 2017 and our average cost of float was approximately 3.0%. During the prior
cost of float was negative as our insurance business generated pre-tax underwriting gains in each year.

A summary of cash and investments held in our insurance businesses as of December 31, 2017 and 2016 follows (in

	December 31,	
	2017	2016
Cash, cash equivalents and U.S. Treasury Bills	$ 73,285	$ 48,888
Equity securities	163,134	134,144
Fixed maturity securities	21,092	22,778
	$ 257,511	$ 205,810

Fixed maturity investments as of December 31, 2017 were as follows (in millions).

	Amortized cost	Unrealized gains/losses	Carrying value
U.S. Treasury, U.S. government corporations and agencies	$ 3,968	$ (22)	$ 3,946
States, municipalities and political subdivisions	840	7	847
Foreign governments	8,570	250	8,820
Corporate bonds, investment grade	5,395	392	5,787
Corporate bonds, non-investment grade	698	190	888
Mortgage-backed securities	714	90	804
	$ 20,185	$ 907	$ 21,092

U.S. government obligations are rated AA+ or Aaa by the major rating agencies. Approximately 88% of all state, munici
subdivisions, foreign government obligations and mortgage-backed securities were rated AA or higher. Non-investment grade sec
securities rated below BBB- or Baa3. Foreign government securities include obligations issued or unconditionally guaranteed by nat
government entities.

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Management's Discussion and Analysis *(Continued)*

Railroad ("Burlington Northern Santa Fe")

Burlington Northern Santa Fe, LLC ("BNSF") operates one of the largest railroad systems in North America. BNSF opera 32,500 route miles of track in 28 states and also operates in three Canadian provinces. BNSF's major business groups are classified shipped and include consumer products, coal, industrial products and agricultural products. A summary of BNSF's earnings follo

	2017	2016	2015
Revenues	$ 21,387	$ 19,829	$ 21,967
Operating expenses:			
Compensation and benefits	4,969	4,769	5,043
Fuel	2,518	1,934	2,656
Purchased services	2,514	2,418	2,546
Depreciation and amortization	2,352	2,128	2,001
Equipment rents, materials and other	1,690	1,895	2,018
Total operating expenses	14,043	13,144	14,264
Interest expense	1,016	992	928
	15,059	14,136	15,192
Pre-tax earnings	6,328	5,693	6,775
Income taxes	2,369	2,124	2,527
Net earnings	$ 3,959	$ 3,569	$ 4,248

Consolidated revenues were $21.4 billion in 2017, representing an increase of $1.6 billion (7.9%) versus 2016. Pre-tax ea 11.2% in 2017 compared to 2016. During 2017, consolidated revenues reflected a 2.4% comparative increase in average revenue per increase in volume. Our volume was 10.3 million cars/units in 2017 compared to 9.8 million in 2016. Our overall volume growth second half of the year compared to the growth experienced in the first half of the year. While we believe the general economy will c in 2018, we expect a slower pace of volume growth. The increase in average revenue per car/unit was primarily attributable to high revenue, increased rates per car/unit and business mix changes.

Revenues from consumer products were $7.1 billion in 2017, representing an increase of 8.8% compared to 2016, reflectin of 6.3% as well as higher average revenue per car/unit. The volume increases were primarily attributable to improving econom normalizing of retail inventories, new services and higher market share, which benefited domestic intermodal, international intermo volumes.

Revenues from industrial products were $5.1 billion in 2017, an increase of 7.7% from 2016, attributable to a volume incre as higher average revenue per car/unit. Volumes in 2017 were higher for sand and other commodities that support drilling. In a strengthening in the industrial sector drove greater demand for steel and taconite. These volume increases were partially offset by products volume due to pipeline displacement of U.S. crude rail traffic.

Revenues from agricultural products increased 1.8% to $4.3 billion in 2017 compared to 2016, primarily due to higher aver unit. Volumes were relatively flat, primarily due to higher shipments of domestic grain, as well as ethanol and other grain products, o exports.

Revenues from coal increased 13.7% to $3.8 billion in 2017 compared to 2016. This increase reflected higher average reve well as 6.3% higher volumes. The volume increases in 2017 were due to continued effects of higher natural gas prices, which led t coal usage. This was partially offset by the effects of unit retirements at coal generating facilities, increased renewable generation a adjustments at customer facilities.

Operating expenses were $14.0 billion in 2017, an increase of $899 million (6.8%) compared to 2016. Our ratio of opera revenues decreased 0.6 percentage points to 65.7% in 2017 versus 2016. Compensation and benefits expenses increased $200 millio to 2016. The increase was primarily due to higher health and welfare costs and volume-related increases, partially offset by lower expenses increased $584 million (30.2%) compared to 2016 primarily due to higher average fuel prices and increased vo

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Railroad ("Burlington Northern Santa Fe") *(Continued)*

Depreciation and amortization expense increased $224 million (10.5%) compared to 2016 due to a larger base of depreciab
Equipment rents, materials and other expense declined $205 million (10.8%) compared to 2016. These declines resulted from th
enactment of the TCJA on an equity method subsidiary, as well as lower personal injury and casualty related costs

Consolidated revenues were approximately $19.8 billion in 2016, a decrease of $2.1 billion (9.7%) compared to 2015. Pre-
$5.7 billion in 2016, a decrease of $1.1 billion (16.0%) compared to 2015. Our total volume was approximately 9.8 million cars/units
to approximately 10.3 million in 2015. In 2016, we experienced declining demand, especially in our coal and crude oil categories. C
decline, driven by structural changes in that business as well as competition from low natural gas prices. The decrease in revenue ref
declines in average revenue per car/unit (5.2%) and volumes (5.0%). The decrease in average revenue per car/unit was primarily att
fuel surcharge revenue driven by lower fuel prices and business mix changes.

Revenues from consumer products were $6.5 billion in 2016, a decline of 0.9% from 2015, reflecting lower average reve
partially offset by volume increases of 1%. Consumer products volumes increased primarily due to higher domestic intermodal volun
of a new automotive customer, partially offset by lower international intermodal volumes.

Revenues from industrial products were $4.8 billion in 2016, a decline of 14.2% compared with 2015. The decrease was at
volumes, primarily for petroleum products, reflecting pipeline displacement of U.S. crude rail traffic and lower U.S. oil productio
experienced lower demand for steel and taconite, partially offset by increased plastics products volume.

Revenues from agricultural products remained relatively unchanged in 2016 at $4.2 billion compared to 2015. Agricultura
increased by 6.3%, primarily due to higher corn, soybean and wheat exports, which offset a decrease in average revenue pe

Revenues from coal decreased 26.9% to $3.4 billion in 2016 compared to 2015, reflecting a 21.1% decline in volumes and a
per car/unit. Demand for coal declined due to reduced energy consumption, coal unit retirements, high coal stockpiles and low na

Operating expenses were $13.1 billion in 2016, a decrease of $1.1 billion (7.9%) compared to 2015, and our ratio of opera
revenues increased 1.4 percentage points to 66.3%. Compensation and benefits expenses decreased $274 million (5.4%) compared to
was primarily due to lower employment levels resulting from lower freight volumes and productivity improvements, partially offset
expenses declined $722 million (27.2%) compared to 2015, due to lower average fuel prices and lower volumes. Purchased serv
$128 million (5.0%) due to lower volumes and cost reductions. Depreciation and amortization expense increased $127 million (6.3%
due to increased assets in service reflecting our ongoing capital additions and improvement programs. Equipment rents, materials a
declined $123 million (6.1%) compared to 2015, primarily due to lower freight volumes and productivity improveme

Utilities and Energy ("Berkshire Hathaway Energy Company")

We hold a 90.2% ownership interest in Berkshire Hathaway Energy Company ("BHE"), which operates a global energy
domestic regulated utility interests are comprised of PacifiCorp, MidAmerican Energy Company ("MEC") and NV Energy. In Gre
subsidiaries operate two regulated electricity distribution businesses referred to as Northern Powergrid. BHE also owns two dom
interstate natural gas pipeline companies. Other energy businesses include AltaLink, L.P. ("AltaLink"), a regulated electricity transmi
in Alberta, Canada and a diversified portfolio of independent power projects. In addition, BHE also operates the second-largest resi
brokerage firm and one of the largest residential real estate brokerage franchise networks in the United States.

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Management's Discussion and Analysis *(Continued)*

Utilities and Energy ("Berkshire Hathaway Energy Company") *(Continued)*

The rates our regulated businesses charge customers for energy and services are based, in large part, on the costs of busi including a return on capital, and are subject to regulatory approval. To the extent these operations are not allowed to include such co rates, operating results will be adversely affected. Revenues and earnings of BHE are summarized below (in million

	Revenues			Earnings		
	2017	2016	2015	2017	2016	2015
PacifiCorp	$ 5,276	$ 5,245	$ 5,279	$ 1,131	$ 1,105	$ 1,026
MidAmerican Energy Company	2,906	2,668	2,554	372	392	292
NV Energy	3,048	2,925	3,382	567	559	586
Northern Powergrid	950	997	1,141	311	367	460
Natural gas pipelines	1,009	986	1,018	446	413	401
Other energy businesses	2,294	2,223	2,321	381	377	394
Real estate brokerage	3,456	2,815	2,536	220	225	191
Corporate interest	—	—	—	(844)	(465)	(499
	$ 18,939	$ 17,859	$ 18,231			
Pre-tax earnings				2,584	2,973	2,851
Income taxes and noncontrolling interests				501	686	719
Net earnings attributable to Berkshire Hathaway shareholders				$ 2,083	$ 2,287	$ 2,13

PacifiCorp

PacifiCorp operates a regulated electric utility in portions of several Western states, including Utah, Oregon and Wyoming. 1% in 2017 compared to 2016. Wholesale and other revenues increased, reflecting higher volumes and average rates, and retail rev slightly, attributable to lower average rates, partly offset by higher volumes. Pre-tax earnings increased $26 million (2%) in 2017 as The increase in earnings reflected higher gross margins (operating revenues less cost of sales), lower operations and maintenance increased depreciation and amortization attributable to additional plant in-service.

Revenues were $5.25 billion in 2016, a slight decline from 2015, reflecting increased retail revenues and lower wholesale a revenues. The increase in retail revenues was primarily due to higher retail rates as volumes were relatively unchanged. The declin revenues were attributable to lower volumes and average prices. Pre-tax earnings in 2016 increased $79 million (7.7%) from 2015, increased gross margins, reflecting lower fuel prices and changes in fuel mix.

MidAmerican Energy Company

MEC operates a regulated electric and natural gas utility primarily in Iowa and Illinois. Revenues increased $238 million compared to 2016, primarily attributable to higher electric operating revenues ($123 million) and increased natural gas operating reve Our retail electric revenues increased $84 million in 2017 compared to 2016, primarily attributable to higher recoveries through bill substantially offset by increases in costs of sales and other expenses) and from non-weather usage and growth and rate factors, part unfavorable impact of milder temperatures in 2017. Our wholesale electric and other revenues increased $39 million in 2017 versus 2 comparative increases in volumes, average rates and transmission fees. The natural gas operating revenues increase was primarily du per-unit costs of gas sold, which was offset by an increase in cost of sales. Pre-tax earnings declined $20 million (5%) in 2017 co reflecting increased depreciation, maintenance and other operating expenses and interest expense and debt extinguishment costs, p comparative increases in electric gross sales margins of $76 million.

Revenues increased $114 million (4.5%) in 2016 compared to 2015, primarily due to increased electric revenues ($148 milli by lower natural gas revenues ($24 million). The increase in electric revenues resulted primarily from a 3.8% increase in customer v rates. Wholesale and other revenues increased primarily due to increased average wholesale prices and higher transmission revenu revenue decline was primarily due to lower average per-unit costs of gas sold ($42 million), partly offset by higher wholesale volume increased $100 million (34.2%) in 2016 compared to 2015. The increase in pre-tax earnings was primarily due to increased gross ma revenues and lower operations and maintenance expenses, partially offset by higher depreciation and amortization from additional service, and higher interest expense.

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NV Energy

NV Energy operates regulated electric and natural gas utilities in Nevada. Revenues increased $123 million (4%) in 2017 c The increase was due primarily to an increase in retail electric operating revenues, which included a combination of increased rates cost adjustments and higher volumes, partly offset by lower revenues from energy efficiency programs (offset by lower operating exp also experienced retail electric revenue declines from the transition of certain commercial and industrial customers electing to purc alternative sources and thus becoming distribution service only customers. Natural gas operating revenue declined $11 million in 201 lower rates, partially offset by higher customer usage. Pre-tax earnings increased $8 million (1%) in 2017 compared to 2016, prima interest expenses.

Revenues were approximately $2.9 billion in 2016, a decrease of $457 million (13.5%) versus 2015. The decline was prima lower electric retail rates resulting from lower energy costs. Electric retail volumes were relatively unchanged. Pre-tax earnings dec (4.6%) in 2016 compared to 2015. The decline was primarily due to an increase in operating expenses of $39 million, partly offset interest expense of $17 million. The increase in operating expenses reflected higher depreciation and amortization and reductions c liabilities in 2015.

Northern Powergrid

Revenues declined $47 million (5%) in 2017 compared to 2016. Unfavorable foreign currency translation effects of a comp U.S. Dollar in 2017 resulted in a $48 million comparative decline in revenues, substantially all of which occurred in the first half of t we experienced comparative declines in distribution revenues, which were substantially offset by higher smart metering revenue. declined $56 million (15%) in 2017 compared to the same period in 2016. The decline was primarily due to foreign currency translat as from increased pension expenses and lower distribution revenues, partially offset by lower asset impairment charges and lower c

Revenues declined $144 million (12.6%) in 2016 compared to 2015, primarily due to the impact of a stronger U.S. Dollar (lower distribution revenues. Pre-tax earnings declined $93 million (20.2%) to $367 million. The decline was due to lower distributio stronger U.S. Dollar, as well as increases in depreciation expense from increased assets in service and higher asset impairme

Natural Gas Pipelines

Revenues increased $23 million (2%) in 2017 compared to 2016. Northern Natural Gas produced higher transportation reve sales, primarily from system balancing activities (largely offset in cost of sales), which were partly offset by lower transportation r River. Pre-tax earnings increased $33 million (8%) in 2017 compared to 2016. The increase was primarily due to the increase in trans and a reduction in expenses and regulatory liabilities related to the impact of an alternative rate structure approved by Kern River's re quarter of 2017, partially offset by higher operating expenses.

Revenues declined $32 million (3.1%) in 2016 as compared to 2015, primarily due to the impact of lower gas sales from b and lower transportation revenues from lower volumes and rates, in part due to comparatively milder temperatures in the first quarte earnings increased $12 million (3.0%) versus 2015, reflecting lower interest expense, resulting from lower average debt balances ar expenses, partly offset by the lower transportation revenues.

Other energy businesses

Revenues increased 3% in 2017 compared to 2016. AltaLink's operating revenues increased $197 million (39%) in 2017 c primarily due to effects of a decision in 2016 by its regulator, which changed the timing of when construction-in-progress expenditu rate base are billable to customers and earned in revenues. The decision resulted in a one-time net reduction in revenue in 2016, reductions in expenses. In 2017, we also experienced a comparative revenue increase of 13% from renewable energy and a comparat from the unregulated retail services business. Pre-tax earnings in 2017 were relatively unchanged from 2016, as increased earnings energy and AltaLink were offset by lower earnings from the unregulated retail services business and other energy vent

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Management's Discussion and Analysis *(Continued)*

Utilities and Energy ("Berkshire Hathaway Energy Company") *(Continued)*

Other energy businesses (Continued)

Revenues declined $98 million (4.2%) in 2016 compared to 2015. The decline in comparative revenues was principally att revenues from AltaLink and from our unregulated retail services business. AltaLink's revenue decline reflected the impact of the regulatory decision by AltaLink's regulator. Pre-tax earnings declined $17 million (4.3%) compared to 2015, primarily due to lower renewable energy businesses, primarily due to higher depreciation expense from additional assets placed in service

Real estate brokerage

Revenues increased 23% in 2017 compared to 2016, primarily due to business acquisitions and an increase in average ho Pre-tax earnings decreased 2% in 2017 as compared to 2016. Earnings in 2017 included increased earnings from franchise businesses lower earnings from brokerage businesses, primarily due to higher operating expenses.

Revenues increased 11.0% to $2.8 billion in 2016 compared to 2015. The increase was primarily attributable to increased transactions (primarily resulting from business acquisitions) and a 2% increase in average home sales prices, as well as higher mo Pre-tax earnings increased $34 million (17.8%) in 2016 compared to 2015, primarily due to the increases in mortgage rev

Corporate interest and income taxes

Corporate interest includes interest on unsecured debt issued by BHE and borrowings from Berkshire insurance subsidiaries BHE's acquisitions of NV Energy and AltaLink. Corporate interest in 2017 included pre-tax charges of $410 million from a tender December 2017 to redeem certain long-term debt of BHE. Otherwise, corporate interest declined 7% in 2017 and 2016 compared to prior years, primarily due to lower average borrowings.

BHE's consolidated effective income tax rates were approximately 7% in 2017, 14% in 2016 and 16% in 2015. BHE's eff rates regularly reflect significant production tax credits from wind-powered electricity generation placed in service. In addition, i applicable to Northern Powergrid and AltaLink were lower than the U.S. statutory income tax rate. The effective tax rate in 2017 de due to an increase in recognized production tax credits.

Manufacturing, Service and Retailing

A summary of revenues and earnings of our manufacturing, retailing and service businesses follows (in milli

	Revenues			Earnings *		
	2017	**2016**	**2015**	**2017**	**2016**	**2015**
Manufacturing	$ 50,445	$ 46,506	$ 36,136	$ 6,861	$ 6,211	$ 4,893
Service and retailing	76,088	73,553	71,689	2,382	2,251	2,222
	$ 126,533	$ 120,059	$ 107,825			
Pre-tax earnings				9,243	8,462	7,115
Income taxes and noncontrolling interests				3,035	2,831	2,432
				$ 6,208	$ 5,631	$ 4,683

* *Excludes certain acquisition accounting expenses, which primarily related to the amortization of identified intangible assets recor with our business acquisitions. The after-tax acquisition accounting expenses excluded from earnings above were $896 million in in 2016 and $476 million in 2015. These expenses are included in "Other" in the summary of earnings on page K-32 and in the section on page K-51.*

Manufacturing

Our manufacturing group includes a variety of businesses that produce industrial, building and consumer products. Indu businesses include specialty chemicals (The Lubrizol Corporation ("Lubrizol")), metal cutting tools/systems (IMC International Companies ("IMC")), equipment and systems for the livestock and agricultural industries (CTB International ("CTB")), and a var products for diverse markets (Marmon, Scott Fetzer and LiquidPower Specialty Products ("LSPI")). Beginning on January 29, 20 products group also includes Precision Castparts Corp. ("PCC"), a leading manufacturer of complex metal products for aerospace, p industrial markets.

Management's Discussion and Analysis *(Continued)*

Manufacturing, Service and Retailing *(Continued)*

Manufacturing (Continued)

Our building products businesses include flooring (Shaw), insulation, roofing and engineered products (Johns Manville), b products (Acme Building Brands), paint and coatings (Benjamin Moore), and residential and commercial construction and enginee systems (MiTek). Our consumer products businesses include leisure vehicles (Forest River), several apparel and footwear operations the Loom, Garan, H.H. Brown Shoe Group and Brooks Sports), and beginning February 29, 2016, the Duracell Company ("Dura manufacturer of high performance alkaline batteries. This group also includes custom picture framing products (Larson Juhl) and (Richline). A summary of revenues and pre-tax earnings of our manufacturing operations follows (in millions).

	Revenues			Pre-tax earnings		
	2017	2016	2015	2017	2016	2015
Industrial products	$ 26,376	$ 24,702	$ 16,760	$ 4,367	$ 4,209	$ 2,994
Building products	11,936	10,772	10,316	1,382	1,178	1,167
Consumer products	12,133	11,032	9,060	1,112	824	732
	$ 50,445	$ 46,506	$ 36,136	$ 6,861	$ 6,211	$ 4,893

Revenues of our manufacturers were approximately $50.4 billion in 2017, an increase of approximately $3.9 billion (8.5%) increased approximately $10.4 billion (28.7%) over 2015. Pre-tax earnings were approximately $6.9 billion in 2017, an increase (10.5%) over 2016 and earnings in 2016 increased $1.3 billion (26.9%) compared to 2015.

Industrial products

Industrial products revenues were approximately $26.4 billion in 2017, an increase of approximately $1.7 billion (6.8%) ver increased revenues at several of our businesses. PCC's revenues increased $754 million (9%) in 2017 compared to the eleven mont period in 2016. On a comparable full year-to-date basis, PCC's revenues increased approximately 2.3% compared to 2016, reflect aerospace and oil and gas markets, partially offset by declines in other power markets. In 2017, PCC produced revenue increases castings, airfoils and forged products and from business acquisitions, partly offset by lower revenues from airframe products and inc products used in power markets. PCC continues to transition into product lines for new programs within the aerospace markets, wh produce future revenue increases, but may have negative effects on revenues in the near term as prior programs wind d

IMC's revenues increased 13%, primarily due to increased customer demand and unit sales and from business acquisitions. for cutting tools was generally higher in 2017. Marmon's revenues increased $349 million (7%) in 2017 versus 2016, primarily acquisitions and higher average metal prices, partly offset by lower overall volumes and changes in mix. Marmon's highway transpo and restaurant equipment businesses experienced volume-based revenue growth in 2017, which was more than offset by declines at t cable and retail store products businesses. Lubrizol's revenues increased $165 million (3%) compared to 2016, primarily due to hig partly offset by effects of the disposition of an underperforming business in 2016. CTB's revenues increased 5% in 2017 compare increase reflected the impact of a bolt-on business acquisition, partly offset by weak demand in the U.S. egg and poultry production price pressures for grain storage systems.

Pre-tax earnings of our industrial products businesses in 2017 increased $158 million (3.8%) compared to 2016. Overall, p percentage of revenues were 16.6% in 2017 and 17.0% in 2016.

PCC's pre-tax earnings decreased 12.5% in 2017 compared to the post-acquisition period in 2016, primarily due to certain and impairment charges that were recorded in the fourth quarter of 2017. Pre-tax earnings from IMC and Marmon increased in 2017 due to a combination of increased sales, increased manufacturing efficiencies, the effects of business acquisitions and ongoing expe Lubrizol's pre-tax earnings increased 17% in 2017 compared to 2016 due to comparatively lower earnings charges related to the dis an underperforming bolt-on business and ongoing cost containment efforts, partly offset by lower gross sales margins, which were p to higher average raw material prices. In 2017, average raw material prices at Lubrizol, including base oil feedstock and petrochemic 9% versus 2016.

Management's Discussion and Analysis *(Continued)*

Manufacturing, Service and Retailing *(Continued)*

Industrial products (Continued)

Industrial products revenues increased approximately $7.9 billion (47.4%) in 2016 versus 2015, primarily due to the inclusio offset by revenue declines of $859 million (5.1%) across our other businesses. Sales volumes of our other businesses declined co reflecting sluggish demand for many product categories, particularly for products sold to businesses in the oil and gas and heavy equ In addition, lower average costs of oil-based raw materials and metals and increased competitive pressures continued to lower avera

Pre-tax earnings increased $1.2 billion (40.6%) in 2016 compared to 2015, reflecting the inclusion of PCC, partially offse earnings declines from our other businesses. Lubrizol's earnings in 2016 included pre-tax losses of $365 million related to the a disposition of an underperforming business. Earnings from several of Marmon's manufacturing businesses and Lubrizol's contin declined, while earnings from IMC increased slightly. Generally, our earnings in 2016 reflected the negative effects of a combina customer demand, sales price and mix changes, and increased restructuring costs, partially offset by the favorable effects of cost con and lower average material prices.

Building products

Building products revenues were approximately $11.9 billion in 2017, an increase of approximately $1.2 billion (10.8%) c Approximately half of the increase was attributable to bolt-on business acquisitions by Shaw and MiTek. The remainder of the incre volume increases at MiTek, Benjamin Moore and Johns Manville, partly offset by changes in prices and product mi

Pre-tax earnings were $1.4 billion in 2017, an increase of $204 million (17.3%) compared to 2016. The comparative earning the fact that approximately $107 million of asset impairment, pension settlement and environmental claim charges were recorded in Benjamin Moore. The comparative earnings increase also was a result of bolt-on acquisitions, partly offset by comparative declines sales margin rates due to higher raw material and other production costs.

Revenues increased $456 million (4.4%) in 2016 compared to 2015, reflecting volume-driven revenue increases by MiTek Acme and Shaw, as well as revenues from bolt-on acquisitions by Shaw and MiTek. The revenue increase reflected increased unit sa product categories, partly offset by lower average sales prices and changes in product mix. Pre-tax earnings increased $11 million compared to 2015. The favorable effects of increased sales volume and lower manufacturing costs in 2016 attributable to deflation in unit costs, were substantially offset by increased charges for asset impairments, pension settlements and environmental c

Consumer products

Consumer products revenues were approximately $12.1 billion in 2017, an increase of $1.1 billion (10%) compared to 2 comparative revenue increases from Duracell and Forest River. Duracell's revenues increased 25.3% in 2017 compared to the te acquisition period in 2016. Forest River's revenues increased 13.7% in 2017 compared to 2016, reflecting a 13.5% comparative incr Apparel and footwear revenues were approximately $4.2 billion in 2017, an increase of 1.6% compared to 2016.

Pre-tax earnings increased $288 million (35%) in 2017 compared to 2016. The increase in earnings was primarily due to i from Duracell and Forest River. Pre-tax earnings from Duracell were $82 million in 2017, compared to a pre-tax loss of $89 millio included significant transition costs arising from the acquisition. The improvement in operating results in 2017 reflects an overall red costs and the positive effects of ongoing restructuring and business development efforts. Forest River's earnings increased 23% in attributable to the increase in sales and lower manufacturing overhead rates. Earnings from apparel and footwear businesses increa compared to 2016, primarily due to increased earnings from the footwear businesses.

Revenues were approximately $11.0 billion in 2016, an increase of approximately $2.0 billion (21.8%) compared to 201 reflected the inclusion of Duracell and a 12% increase in Forest River's revenues, primarily attributable to increased unit sales. A declined $81 million (1.9%) in 2016 compared to 2015, reflecting lower footwear sales and the impact of a divestiture by Fruit

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Management's Discussion and Analysis *(Continued)*

Manufacturing, Service and Retailing *(Continued)*

Consumer products (Continued)

Pre-tax earnings increased $92 million (12.6%) in 2016 compared to 2015. The earnings increase reflected increased earn River and apparel and footwear businesses, partly offset by pre-tax losses of Duracell. In 2016, Duracell incurred a pre-tax loss o $89 million primarily due to significant transition, business integration and restructuring costs. Forest River generated a pre-tax ear 28%, primarily due to increased sales volumes and higher gross margins. Earnings of our apparel businesses increased 22% in 2 attributable to lower restructuring costs and a loss in 2015 from the disposition of a Fruit of the Loom operation, partly offset by lo our footwear businesses.

Service and retailing

Our service and retailing businesses are comprised of a large group of independently managed businesses engaged in a vari summary of revenues and pre-tax earnings of these operations follows (in millions).

	Revenues			Pre-tax earnings		
	2017	2016	2015	2017	2016	2015
Service	$ 11,249	$ 10,386	$ 10,201	$ 1,298	$ 1,161	$ 1,156
Retailing	15,064	15,092	13,265	785	659	564
McLane Company	49,775	48,075	48,223	299	431	502
	$ 76,088	$ 73,553	$ 71,689	$ 2,382	$ 2,251	$ 2,222

Service

Our service businesses offer fractional ownership programs for general aviation aircraft (NetJets) and high technology trai aircraft (FlightSafety). We also distribute electronic components (TTI) and franchise and service a network of quick service restaura Other service businesses include the electronic distribution of corporate news, multimedia and regulatory filings (Business Wire) newspapers (Buffalo News and the BH Media Group) and operation of a television station in Miami, Florida (WPLG). Also include third party logistics business that primarily serves the petroleum and chemical industries (Charter Brokerage).

Service business revenues were $11.2 billion in 2017, an increase of $863 million (8%) compared to 2016, primarily a comparative increases at TTI and NetJets. TTI's sales increased 16% in 2017 compared to 2016, primarily due to higher customer revenues increased due to an increase in revenue flight hours and increased aircraft management service revenues.

Pre-tax earnings were $1.3 billion in 2017, an increase of $137 million (12%) compared to 2016. The comparative increas primarily attributable to increased earnings of NetJets and TTI, partly offset by lower earnings from FlightSafety, as well as our m businesses.

Revenues increased 1.8% to $10.4 billion in 2016, primarily due to revenue increases from TTI and Charter Brokerage, p revenue decrease from NetJets. TTI's revenues increased 7.2%, primarily due to sales volume increases in Asia, Europe and through the increase from Charter Brokerage primarily derived from a commodity trading business launched in 2015. NetJets' revenues reflecting lower aircraft sales.

Pre-tax earnings were $1.2 billion in 2016, relatively unchanged versus 2015, reflecting increased earnings from NetJets a from our newspaper operations. NetJets' earnings increased 19%, primarily due to lower subcontracting expense and a decline in lo impairments and dispositions, partly offset by increases in depreciation and restructuring charges and reduced aircraft sales margin were relatively unchanged, as changes in geographic sales mix and price competition produced lower gross margin rates, substanti aforementioned revenue increase.

Retailing

Our retailers include Berkshire Hathaway Automotive ("BHA"), which we acquired in the first quarter of 2015. BHA incl dealerships that sell new and pre-owned automobiles, and offer repair services and related products. BHA also operates two insuran auto auctions and an automotive fluid maintenance products distributor. Our retailing businesses also include four home furnishings (Nebraska Furniture Mart, R.C. Willey, Star Furniture and Jordan's), which sell furniture, appliances, flooring and elect

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Retailing (Continued)

Our other retailing businesses include three jewelry retailing businesses (Borsheims, Helzberg and Ben Bridge), See's Canc
products), Pampered Chef (high quality kitchen tools), Oriental Trading Company (party supplies, school supplies and toys and nov
Louis Motorrad ("Louis"), a Germany-based retailer of motorcycle accessories acquired in the second quarter of 201

Retailing revenues were $15.1 billion in 2017, slightly lower than 2016. BHA's aggregate revenues, which represented 6
retailing revenues, declined 1.3% in 2017 compared to 2016, due primarily to a 3.7% decline in new and used cars sold, partly offse
and finance and insurance revenues. Revenues of our other retailers increased 1.7% in 2017 compared to 2016.

Pre-tax earnings increased $126 million (19%) in 2017 as compared to 2016. The increase reflected comparatively higher e
primarily due to increased earnings from finance and insurance activities and lower selling and administrative expenses, partly offset
volumes and margins. Pre-tax earnings of our home furnishings retailers increased 6.5% in 2017 compared to 2016. Pampered Ch
comparatively higher earnings in 2017, primarily attributable to revenue increases and expense management effort

Retailing revenues increased $1.8 billion (13.8%) in 2016 to $15.1 billion as compared to 2015. The acquisitions of BHA ar
for approximately $1.6 billion of the comparative increase. Home furnishings' revenues increased $227 million (7.8%), primarily c
opened in 2015 by Nebraska Furniture Mart and Jordan's, as well as modest organic growth. Pre-tax earnings increased $95 millior
compared to 2015. The increase reflected the impact of the BHA and Louis acquisitions and increased earnings from most of our oth
benefitted from a combination of revenue increases and cost savings initiatives.

McLane Company

McLane operates a wholesale distribution business that provides grocery and non-food consumer products to retailers and c
("grocery") and to restaurants ("foodservice"). McLane also operates businesses that are wholesale distributors of distilled spirits
("beverage"). The grocery and foodservice businesses generate high sales volumes and very low profit margins and have several sig
including Walmart, 7-Eleven and Yum! Brands. A curtailment of purchasing by any of its significant customers could have an adv
McLane's periodic revenues and earnings.

McLane's revenues were approximately $49.8 billion in 2017, an increase of 3.5% compared to 2016. The increase in rever
due to a 4.7% increase in grocery business sales. Pre-tax earnings in 2017 were $299 million, a decrease of $132 million (31%) com
earnings decline reflected a 57% decline in earnings from our grocery operations, partly offset by a $39 million increase in gains f
Throughout 2017, significant pricing pressures and an increasingly competitive business environment negatively affected our op
particularly with respect to the grocery business. These conditions contributed to declining gross margin rates, which together with
depreciation and certain other operating expenses produced a 29 basis point decline in our consolidated operating margin rate (ratio o
to revenues) in 2017 compared to 2016. Our grocery and foodservice businesses will likely continue to be subject to intense comp

Revenues were $48.1 billion in 2016, a decline of $148 million (0.3%) compared to 2015. In 2016, we experienced a de
revenues, partly offset by an increase in foodservice revenues. Earnings were $431 million in 2016, a decrease of $71 million (14%)
The reduced earnings was primarily due to a reduction in McLane's operating margin rate. The decline was primarily due to increase
costs. Additionally, earnings in 2015 included a gain of $19 million from the disposition of a subsidiary.

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Management's Discussion and Analysis *(Continued)*

Finance and Financial Products

Our finance and financial products businesses include manufactured housing and finance (Clayton Homes), transportat manufacturing and leasing businesses (UTLX and XTRA, and together, "transportation equipment leasing"), as well as other leasi activities. A summary of revenues and earnings from our finance and financial products businesses follows (in millio

	Revenues			Earnings		
	2017	2016	2015	2017	2016	2015
Manufactured housing and finance	$ 5,010	$ 4,230	$ 3,576	$ 765	$ 744	$ 706
Transportation equipment leasing	2,609	2,650	2,540	869	959	909
Other	757	795	848	424	427	471
	$ 8,376	$ 7,675	$ 6,964			
Pre-tax earnings				2,058	2,130	2,086
Income taxes and noncontrolling interests				723	703	708
				$ 1,335	$ 1,427	$ 1,378

Manufactured housing and finance

Clayton Homes' revenues were $5.0 billion in 2017, an increase of $780 million (18%) compared to 2016. The revenues inc due to higher home sales, attributable to an increase in overall unit sales (9%) and higher average prices. The increase in average pr due to sales mix changes, which reflected increases in site built home sales, a relatively new business for Clayton. Site built homes i content and unit prices tend to be higher, although gross sales margin rates are typically lower than manufactured homes. Interest an revenues increased 2% in 2017 compared to 2016.

Pre-tax earnings increased $21 million (2.8%) in 2017 compared to 2016. Pre-tax earnings in 2017 from manufacturing, ret activities increased, while earnings from finance activities declined slightly from 2016. Earnings in 2017 also included a gain from offset by increased employee healthcare, technology, marketing and other expenses. A significant portion of Clayton Homes' earnin from lending activities, which in recent years benefitted from relatively low delinquency rates and loan losses and from low averag borrowings. As of December 31, 2017, Clayton Homes' installment loan portfolio was approximately $13.7 billion

Revenues increased $654 million (18%) in 2016 compared to 2015, attributable to a 30% increase in revenues from home s to a 25% increase in units sold and product mix changes. Interest and other financial service income increased 1.8% from 2015. P increased $38 million (5.4%) compared to 2015. Earnings benefitted from increased home sales and improved manufacturing and r margins, partly offset by lower earnings from lending and financial services and increased insurance losses.

Transportation equipment leasing

Transportation equipment leasing revenues declined $41 million (2%) in 2017 compared to 2016. The revenue decline was and trailer units on lease and lower railcar lease rates. We currently believe industry railcar capacity available for lease exceeds d contributing to lower lease rates. We also experienced increased other service revenues, primarily attributable to business acquisitio foreign currency translation effects.

Pre-tax earnings declined $90 million (9%) in 2017 compared to 2016. Earnings as a percentage of revenues decreased fro 33.3% in 2017. These decreases reflected the aforementioned lease revenue declines and higher railcar repair, storage costs and dep Significant components of our operating costs, such as depreciation expense, do not vary proportionately to revenue changes and th revenues can produce a disproportionate effect on earnings. In response to weakened demand in the railcar and oil and gas industri overhead cost reduction initiatives.

Transportation equipment leasing revenues increased $110 million (4.3%) in 2016 compared to 2015, primarily from the ac Electric Company's tank car fleet and its railcar repair services business in 2015 and increased rates and tank car additions. These r were partly offset by lower utilization rates, unfavorable foreign currency translation effects, lower crane lease demand in North Am volume related to oil and gas markets.

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Pre-tax earnings increased $50 million (5.5%) in 2016 compared to 2015. The increase was primarily attributable to revenu depreciation rates on certain tank car assets, partially offset by higher repair costs and interest expense on borrowings from a Berl subsidiary.

Other

Other finance activities include CORT furniture leasing, our share of the earnings of a commercial mortgage servicing busin which we own a 50% interest, and interest and dividends from loans and equity security investments. Pre-tax earnings were $424 relatively unchanged from 2016, and reflected lower earnings from CORT, partly offset by slightly higher interest and finance incor also includes income from interest rate spreads charged on borrowings by a Berkshire financing subsidiary that are used to finance made by Clayton Homes and assets held for lease by UTLX. Other earnings in 2016 were $427 million, a decrease of $44 million c The decline reflected lower earnings from investment securities, partly offset by increased earnings from CORT and Be

Investment and Derivative Gains/Losses

A summary of investment and derivative gains and losses and other-than-temporary impairment losses on investments foll

	2017	2016	2015
Investment gains/losses	$ 1,410	$ 7,553	$ 9,373
Derivative gains/losses	718	751	974
Gains/losses before income taxes and noncontrolling interests	2,128	8,304	10,347
Income taxes and noncontrolling interests	751	1,807	3,622
Net gains/losses	$ 1,377	$ 6,497	$ 6,725

Investment gains/losses

Investment gains/losses arise primarily from the sale, redemption or exchange of investments. The timing of gains or losses effect on periodic earnings. Investment gains and losses included in earnings usually have minimal impact on the periodic changes i shareholders' equity since most of our investments are recorded at fair value with the unrealized gains and losses included in shareh component of accumulated other comprehensive income.

We believe the amount of investment gains/losses included in earnings in any given period typically has little analytical or Our decisions to sell securities are not motivated by the impact that the resulting gains or losses will have on our reported earnings. A consider investment gains and losses as necessarily meaningful or useful in evaluating our periodic results, we provide information to of such gains and losses when reflected in our earnings.

As discussed in Note 1(u) to the Consolidated Financial Statements, we adopted a new accounting standard on January 1, 20 reporting of unrealized gains and losses on our investments in equity securities. Beginning as of that date, unrealized gains and losse equity securities will be included in our Consolidated Statements of Earnings along with realized gains and losses from dispositions. does not permit the restatement of prior years' statements of earnings. Upon adoption of this accounting standard, we reclassified net gains of $61.5 billion related to our investments in equity securities from accumulated other comprehensive income to retain

While the adoption of this standard did not affect our consolidated shareholders' equity, it will almost certainly produce a increase in the volatility of our periodic net earnings in the future given the magnitude of our existing equity securities portfolio a volatility of equity securities prices. To illustrate the impact of this standard, our other comprehensive income for the year ending D included after-tax net unrealized gains from equity securities of approximately $19 billion. Had the new accounting standard been beginning of 2017, this amount would have been included in our Consolidated Statements of Earnings. However, our consolidated income for the period would have been unchanged.

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Management's Discussion and Analysis *(Continued)*

Investment and Derivative Gains/Losses *(Continued)*

Investment gains/losses (Continued)

Pre-tax investment gains were approximately $1.4 billion in 2017, $7.6 billion in 2016 and $9.4 billion in 2015. Investme included $4.2 billion from the redemptions of our Wrigley and Kraft Heinz preferred stock investments and from the sales of Dow C stock that was received upon the conversion of our Dow Chemical preferred stock investment. We also realized pre-tax gains of connection with the tax-free exchange of our shares of P&G common stock for 100% of the common stock of Duracell. Income tax e investment gains in 2016 included a benefit from the reduction of certain deferred income tax liabilities in connection with the ex common stock for Duracell. Our after-tax gain from this transaction was approximately $1.9 billion. Pre-tax investment gains in 2015 holding gains related to our investment in Kraft Heinz of $6.8 billion. In connection with its acquisition of Kraft Foods on July 2, 2 issued new shares of its common stock in exchange for the outstanding shares of Kraft Foods common stock, thus reducing Berksh interest in Kraft Heinz by approximately 50%. Under the equity method of accounting, such transactions are treated by the investor a of its interests.

Derivative gains/losses

Derivative gains/losses primarily represented the changes in fair value of our equity index put option contract liabilities. Th in the fair values of these liabilities are recorded in earnings and can be significant, reflecting the volatility of underlying equity mark in the inputs used to measure such liabilities.

Changes in the values of our equity index put option contract liabilities produced pre-tax gains of $718 million in 2017, $6 and $1.0 billion in 2015. The gains in each year reflected the effects of shorter remaining contract durations and overall higher

As of December 31, 2017, the aggregate intrinsic value of our equity put option contracts was approximately $800 million liability was approximately $2.2 billion. Our ultimate payment obligations, if any, under our equity index put option contracts will b the contract expiration dates (beginning in June 2018), and will be based on the intrinsic value as defined under the con

In July 2016, our last credit default contract was terminated by mutual agreement with the counterparty and we paid th $195 million. This contract produced pre-tax earnings of $89 million in 2016 and pre-tax losses of $34 million in 20

Other

A summary of after-tax other earnings (losses) which include corporate income (including income from our investments expenses and income taxes not allocated to operating businesses is summarized below (in millions).

	2017	2016	2015
Kraft Heinz earnings	$ 972	$ 706	$ 841
Acquisition accounting expenses	(936)	(846)	(515)
Corporate interest expense, before foreign currency effects	(266)	(256)	(146)
Corporate interest expense – Euro note foreign exchange gains (losses)	(655)	159	(45)
Other	59	(106)	(105)
Net earnings (losses) attributable to Berkshire Hathaway shareholders	$ (826)	$ (343)	$ 30

Our after-tax Kraft Heinz earnings includes Berkshire's share of Kraft Heinz's earnings attributable to common sharehol pursuant to the equity method. Our after-tax Kraft Heinz earnings in 2017 excludes approximately $1.1 billion from the net effects of Heinz's net earnings. Kraft Heinz earnings included pre-tax dividend income from our preferred stock investment of $180 millio $852 million in 2015. Kraft Heinz redeemed the preferred stock in June 2016.

After-tax other earnings (losses) also include charges arising from the application of the acquisition method in connection w business acquisitions. Such charges were primarily from the amortization of intangible assets recorded in connection with those bus

In each of the last three years, Berkshire issued Euro-denominated debt and at December 31, 2017, the aggregate par amou €6.85 billion. Changes in foreign currency exchange rates can produce sizable non-cash gains and losses from the periodic revaluatio into U.S. Dollars. The increase in interest expense in 2016 over 2015 before those gains and losses was primarily attributable to in outstanding debt.

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Financial Condition

Our consolidated balance sheet continues to reflect significant liquidity and a strong capital base. Our consolidated sharel December 31, 2017 was $348.3 billion, an increase of $65.3 billion since December 31, 2016 (based upon shareholders' equity as or our 2016 Form 10-K). Net earnings attributable to Berkshire shareholders in 2017 were $44.9 billion. Net unrealized appreciation o foreign currency translation gains included in other comprehensive income in 2017 were approximately $18.9 billion and $2.2 bill

At December 31, 2017, our insurance and other businesses held cash, cash equivalents and U.S. Treasury Bills of approxima and investments (excluding our investment in Kraft Heinz) of $185.4 billion. In 2017, Berkshire issued €1.1 billion of senior no $1.1 billion of maturing senior notes. Berkshire's outstanding debt at December 31, 2017 was approximately $18.8 billion, an incre from December 31, 2016, of which $990 million was attributable to foreign currency exchange rate changes applicable to the €6.85 of Euro-denominated senior notes. Berkshire term debt of $800 million matured in February 2018 and $750 million will mature i

Our railroad, utilities and energy businesses (conducted by BNSF and BHE) maintain very large investments in capital ass and equipment) and will regularly make significant capital expenditures in the normal course of business. During 2017, BHE's and expenditures were $4.6 billion and $3.3 billion, respectively. We forecast capital expenditures of these two operations will approxim 2018.

BNSF's outstanding debt approximated $22.5 billion as of December 31, 2017, an increase of $455 million since December 2017, BNSF issued $1.25 billion of senior unsecured debentures with $500 million due in 2027 and $750 million due in 2047. BN $650 million par amount will mature in March 2018. Outstanding borrowings of BHE and its subsidiaries were approximately $ December 31, 2017, an increase of $2.6 billion since December 31, 2016. During 2017, BHE and its subsidiaries issued approximat debt with maturity dates ranging from 2022 to 2057. In January 2018, BHE issued senior unsecured debt of $2.2 billion with matur 2021 to 2048. The proceeds from these borrowings were used to repay certain short-term borrowings and for other general corporat the next twelve months, approximately $3.4 billion of BHE and subsidiary term debt will mature. Berkshire does not guarantee the issued by BNSF, BHE or any of their subsidiaries and is not committed to provide capital to support BNSF, BHE or any of thei

Finance and financial products assets were approximately $41.9 billion as of December 31, 2017, a decrease of $175 December 31, 2016. Finance assets consist primarily of loans and finance receivables, various types of property held for lease, cash and U.S. Treasury Bills. Finance and financial products liabilities declined $3.0 billion to approximately $16.7 billion as of Decem decrease was primarily due to a reduction in borrowings of approximately $2.3 billion, reflecting repayments of $3.6 billion, partly o of senior unsecured notes issued in January by a wholly-owned financing subsidiary, Berkshire Hathaway Finance Corporation ("B BHFC notes mature in 2019 and 2020. BHFC's outstanding borrowings were $12.9 billion at December 31, 2017. In January 2018, amount of BHFC senior notes matured and an additional $4.0 billion will mature over the remainder of 2018. BHFC's senior note b to fund loans originated and acquired by Clayton Homes and a portion of assets held for lease by our UTLX railcar leasing busi guarantees the full and timely payment of principal and interest with respect to BHFC's senior notes.

Berkshire's Board of Directors has authorized Berkshire management to repurchase, at its discretion, Berkshire Class A and stock at prices no higher than a 20% premium over book value per share. We will not repurchase our stock if it reduces the total amo consolidated cash, cash equivalents and U.S. Treasury Bills holdings below $20 billion. There is no obligation to repurchase any stoc is expected to continue indefinitely. Financial strength and redundant liquidity will always be of paramount importance at Berkshi share repurchases in 2017.

Contractual Obligations

We are party to contracts associated with ongoing business and financing activities, which will result in cash payments to future periods. Certain obligations included in our Consolidated Balance Sheets, such as notes payable, require future payments c specified dates and in fixed and determinable amounts. Other obligations pertain to the acquisition of goods or services in the future rentals under operating leases and certain purchase obligations, and are not currently reflected in our financial statements. These ol recognized in future periods as the goods are delivered or services are provided.

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Contractual Obligations *(Continued)*

The timing and/or amount of the payments under certain contracts are contingent upon the outcome of future events. Most timing and amount of future payments of unpaid losses and loss adjustment expenses arising under property and casualty insurance contracts, including retroactive reinsurance contracts, are contingent upon the outcome of claim settlement activities or events. Oblig life, annuity and health insurance benefits are also contingent on future premiums, allowances, mortality, morbidity, expenses and pol amounts included in the following table are based on the liability estimates reflected in our Consolidated Balance Sheet as of Dec Although certain insurance losses and loss adjustment expenses and life, annuity and health benefits are recoverable under reinsuran receivables are not reflected in the table.

A summary of our contractual obligations as of December 31, 2017 follows (in millions). Actual payments will likely significantly, from estimates reflected in the table.

	Estimated payments due by period				
	Total	2018	2019-2020	2021-2022	After 2022
Notes payable and other borrowings, including interest	$ 151,777	$ 21,736	$ 19,099	$ 15,707	$ 95,235
Operating leases	8,486	1,330	2,259	1,581	3,316
Purchase obligations *(1)*	39,957	12,959	6,940	5,018	15,040
Unpaid losses and loss adjustment expenses *(2)*	104,059	20,614	21,377	14,740	47,328
Life, annuity and health insurance benefits *(3)*	33,095	1,196	(29)	293	31,635
Other	16,899	3,328	813	2,344	10,414
Total	$ 354,273	$ 61,163	$ 50,459	$ 39,683	$ 202,968

(1) *Primarily related to fuel, capacity, transmission and maintenance contracts and capital expenditure commitments of BHE and purchase commitments of NetJets.*

(2) *Includes unpaid losses and loss adjustment expenses under retroactive reinsurance contracts.*

(3) *Amounts represent estimated undiscounted benefits, net of estimated future premiums, as applicable.*

Critical Accounting Policies

Certain accounting policies require us to make estimates and judgments in determining the amounts reflected in the Conso Statements. Such estimates and judgments necessarily involve varying, and possibly significant, degrees of uncertainty. Accordingly currently recorded in the financial statements will likely be adjusted in the future based on new available information and changes circumstances.

Property and casualty losses

We record liabilities for unpaid losses and loss adjustment expenses (also referred to as "gross unpaid losses" or "claim liab estimates of the ultimate amounts payable for losses occurring on or before the balance sheet date. The timing and amount of ultimat contingent upon, among other things, the timing of claim reporting from insureds and ceding companies and the final determination through the loss adjustment process. We use a variety of techniques in establishing claim liabilities and all techniques require signific assumptions.

As of the balance sheet date, recorded claim liabilities include provisions for reported claims, as well as claims not yet r development of reported claims. The period between the loss occurrence date and loss settlement date is the "claim-tail." Property c relatively short claim-tails, absent litigation. Casualty claims usually have longer claim-tails, occasionally extending for decades. Ca be more susceptible to litigation and the impact of changing contract interpretations. The legal environment and judicial process fur extending claim-tails.

Our consolidated claim liabilities as of December 31, 2017 were $104 billion, of which 87% related to GEICO and the Be Reinsurance Group (General Re Group and NICO Group). Additional information regarding significant uncertainties inherent in th techniques of these businesses follows.

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Property and casualty losses *(Continued)*

GEICO

GEICO predominantly writes private passenger auto insurance. As of December 31, 2017, GEICO's gross unpaid losses w
Claim liabilities, net of reinsurance recoverable were $17.2 billion.

GEICO's claim reserving methodologies produce liability estimates based upon the individual claims. The key assumptio
liability estimates include projections of ultimate claim counts ("frequency") and average loss per claim ("severity"). We utilize a cor
actuarial estimation methods, including Bornhuetter-Ferguson and chain-ladder methodologies.

Claim liability estimates for automobile liability coverages (such as bodily injury ("BI"), uninsured motorists, and personal
are more uncertain due to the longer claim-tails, so we establish additional case development estimates. As of December 31, 2017,
liabilities averaged approximately 30% of the case reserves. We select case development factors through analysis of the overall adeq
case liabilities.

For incurred-but-not-reported ("IBNR") claims, liabilities are based on projections of the ultimate number of claims expec
unreported) for each significant coverage. We use historical claim count data to develop age-to-age projections of the ultimate cou
accident period, from which we deduct reported claims to produce the number of unreported claims. We estimate the average costs p
and apply such estimates to the unreported claim counts, producing an IBNR liability estimate. We may record additional IBNR
actuarial techniques are difficult to apply.

We test the adequacy of the aggregate claim liabilities using one or more actuarial projections based on claim closure mod
incurred loss triangles. Each type of projection analyzes loss occurrence data for claims occurring in a given period and projects t

Our claim liability estimates recorded at the end of 2016 increased $517 million during 2017, which produced a correspon
pre-tax earnings. We modified the assumptions used to estimate liabilities at December 31, 2017 to reflect the most recent frequency
Future development of recorded liabilities will depend on whether actual frequency and severity are more or less than anti

With respect to liabilities for BI claims, our most significant claim category, we believe it is reasonably possible that avera
change by at least one percentage point from the severities used in establishing the recorded liabilities at December 31, 2017. We e
percentage point increase or decrease in BI severities would produce a $275 million increase or decrease in recorded liabilities, wit
decrease or increase in pre-tax earnings. Many of the economic forces that would likely cause BI severity to differ from expectation
cause severities for other injury coverages to differ in the same direction.

Berkshire Hathaway Reinsurance Group ("BHRG")

BHRG's liabilities for unpaid losses and loss adjustment expenses derive primarily from reinsurance contracts issued throug
and the General Re Group. In connection with reinsurance contracts, the nature, extent, timing and perceived reliability of premium a
received from ceding companies varies widely depending on the type of coverage and the contractual reporting terms. Contract term
coverages also tend to lack standardization and may evolve more rapidly than primary insurance policies.

The nature and extent of loss information provided under many facultative (individual risk), per occurrence excess or retro
contracts may not differ significantly from the information received under a primary insurance contract if reinsurer personnel either
the ceding company in settling individual claims or manage the claims themselves. However, loss information is often less detaile
aggregate excess-of-loss and quota-share contracts. Additionally, loss information we receive through periodic reports is often in a
rather than on an individual claim basis. Loss data includes recoverable paid losses, as well as case loss estimates. Ceding compan
provide IBNR estimates to reinsurers.

Loss reporting to reinsurers is typically slower in comparison to primary insurers. Periodic premium and claims reports a
ceding companies. In the U.S., such reports are generally required at quarterly intervals ranging from 30 to 90 days after the end of th
Outside of the U.S., reinsurance reporting practices may vary further. In certain countries, clients report annually, often 90 to 180 da
the annual period. In some instances, reinsurers assume and cede underlying risks thereby creating multiple contractual parties bet
primary insured, potentially compounding the claim reporting delays. The relative impact of reporting delays on the reinsurer may v
the type of coverage, contractual reporting terms, the magnitude of the claim relative to the attachment point of the reinsurance cove
reasons.

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Management's Discussion and Analysis *(Continued)*

Property and casualty losses *(Continued)*

Berkshire Hathaway Reinsurance Group ("BHRG") (Continued)

As reinsurers, the premium and loss data we receive is at least one level removed from the underlying claimant, so there is data reported is incomplete, inaccurate or the claim is outside the coverage terms. When received, we review the information for c compliance with the contract terms. Generally, our reinsurance contracts permit us to access the ceding company's books and records subject business, thus providing the ability to audit the reported information. In the normal course of business, disputes occasionally whether claims are covered by our reinsurance policies. We resolve most coverage disputes through negotiation with the client. If d resolved, our contracts generally provide arbitration or alternative dispute resolution processes. There are no coverage disputes at thi adverse resolution would likely have a material impact on our consolidated results of operations or financial conditi

A summary of BHRG's property and casualty unpaid losses and loss adjustment expenses, other than retroactive reinsuran adjustment expenses, as of December 31, 2017 follows (in millions).

	General Re Group			NICO Group				
	Property	Casualty	Total	Property	Casualty	Total	Property	C
Reported case liabilities	$ 1,488	$ 6,608	$ 8,096	$ 3,477	$ 2,833	$ 6,310	$ 4,965	$
IBNR liabilities	1,622	6,630	8,252	2,574	4,487	7,061	4,196	
Gross unpaid losses and loss adjustment expenses	3,110	13,238	16,348	6,051	7,320	13,371	9,161	
Reinsurance recoverable	256	610	866	33	418	451	289	
Net unpaid losses and loss adjustment expenses	$ 2,854	$ 12,628	$ 15,482	$ 6,018	$ 6,902	$ 12,920	$ 8,872	$

Gross unpaid losses and loss adjustment expenses in the table above consist primarily of traditional property and casualty primarily under excess-of-loss and quota-share treaties. Under certain contracts, coverage can apply to multiple lines of business wri company may not report loss data by such lines consistently, if at all. In those instances, we allocated losses to property and casualty internal estimates.

With respect to the General Re Group, we use a variety of actuarial methodologies to establish unpaid losses and loss adju Certain methodologies, such as paid and incurred loss development techniques, incurred and paid loss Bornhuetter-Ferguson technic and severity techniques, are utilized, as well as ground-up techniques when appropriate. The critical processes involved in estimating loss adjustment expenses include the establishment of case liability estimates, the determination of expected loss ratios and loss re which drive IBNR liability estimates, and the comparison of reported activity to the expected loss reporting pattern

General Re Group's process for estimating unpaid losses and loss adjustment expenses starts with case loss estimates rep companies. We independently evaluate certain reported case losses and if appropriate, we use our own case liability estimate. As of D our case loss estimates exceeded ceding company estimates by approximately $2.2 billion, which were concentrated in legacy work claims occurring over 10 years ago. We also periodically conduct detailed reviews of individual client claims, which may cause us estimates.

In estimating General Re Group's IBNR liabilities, we consider expected case loss emergence and development patterns expected loss ratios by year. In this process, we classify all loss and premium data into groups or portfolios of policies based primari (e.g., treaty, facultative and program), line of business (e.g., auto liability, property and workers' compensation) and/or geographic j some cases contractual features or market segment. For each portfolio, we aggregate premiums and losses by accident year or cove analyze the paid and incurred loss data over time. We estimate the expected development of reported claims, which, together with ratios, are used to calculate IBNR liability estimates. Factors affecting our loss development analysis include, but are not limited t following: client claims reporting and settlement practices; the frequency of client company claim reviews; policy terms and cover retention levels and occurrence and aggregate policy limits); loss trends; and legal trends that result in unanticipated losses. Collecti influence our selections of expected case loss emergence patterns.

For the NICO Group, we generally also establish reinsurance claim liabilities on a contract-by-contract basis determined f loss estimates reported by ceding companies and IBNR liabilities that are primarily a function of an anticipated loss ratio for the reported case loss estimates. Liabilities are subsequently adjusted over time to reflect case losses reported versus expected case losse form judgments on the adequacy of the expected loss ratio and the level of IBNR liabilities required for unreported claims. Anticipa also revised to include estimates of the impact of major catastrophe events as they become known.

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Property and casualty losses *(Continued)*

Berkshire Hathaway Reinsurance Group ("BHRG") (Continued)

Certain catastrophe, individual risk and aviation excess-of-loss contracts tend to generate low frequency/high severity loss and techniques for estimating liabilities under such contracts generally rely more on a per-policy assessment of the ultimate cost as individual loss event rather than with an analysis of the historical development patterns of past losses.

In the aggregate, we reduced net losses for prior years' occurrences by $295 million in 2017, which produced a correspo pre-tax earnings. Reported claims for prior years' property loss events were less than anticipated and we reduced our estimated ulti $152 million. However, property losses incurred during any given period may be more volatile because of the effect of catastrophe a property loss events.

In 2017, reported nominal losses for prior years' workers' compensation claims of the General Re Group were less than reevaluating expected remaining IBNR estimates, we reduced our liabilities by $160 million. An increase of ten percent in the tail o emergence pattern and an increase of ten percent in the expected loss ratios would produce a net increase in workers' compensation approximately $1 billion, producing a corresponding decrease in pre-tax earnings. We believe it is reasonably possible for these assu at these rates.

We reduced General Re Group's other casualty, excluding asbestos and environmental, estimated ultimate losses for prior $114 million in 2017 reflecting lower than expected reported losses, resulting in a $114 million increase in pre-tax earnings. For our and general liability portfolios, we estimate that an increase of five percent in the claim-tails of the expected loss emergence patterns increase in expected loss ratios would produce a net increase in our nominal IBNR liabilities and a corresponding reduction in pre approximately $900 million. While we believe it is reasonably possible for these assumptions to increase at these rates, more likely than $900 million given the diversification in worldwide business.

Overall industry-wide loss experience data and informed judgment are used when internal loss data is of limited reliabi asbestos, environmental and latent injury liability estimates. Our combined net liabilities for such losses at December 31, 2017, we $1.6 billion, which included an increase in estimated ultimate losses of approximately $145 million during 2017, which produced reduction in pre-tax earnings. Loss estimations for these exposures are difficult to determine due to the changing legal environment, be required in the future if new exposures or claimants are identified, new claims are reported or new theories of liability emerge. previously described methodologies, we consider "survival ratios", which is the average net claim payments in recent years in rela losses, as a rough guide to reserve adequacy. Our survival ratio was approximately 15 years as of December 31, 201

Retroactive reinsurance

Our retroactive reinsurance contracts cover loss events occurring before the contract inception dates. Claim liabilities relatin reinsurance contracts are predominately related to casualty or liability exposures. We expect the claim-tails to be very long. Our gr deferred charge assets, and net liabilities at December 31, 2017 were as follows (in millions).

	Gross unpaid losses	Deferred charges	Liabilities, net of deferred charges
December 31, 2017	$42,937	$15,278	$27,659

Our contracts are generally subject to maximum limits of indemnifications. We currently expect that maximum remaining g under our retroactive policies will not exceed $57 billion due to the applicable aggregate contract limits. Absent significant judici changes affecting asbestos, environmental or latent injury exposures, we also currently believe it unlikely that losses will develo maximum losses payable or downward by more than 15% of our $42.9 billion estimated liability at December 31, 20

We establish liability estimates by individual contract, considering exposure and development trends. In establishing our lia often analyze historical aggregate loss payment patterns and project expected ultimate losses under various scenarios. We assign jud factors to these scenarios and an expected outcome is determined. We then monitor subsequent loss payment activity and review reports and other available information concerning the underlying losses. We re-estimate the expected ultimate losses when signi significant deviations from expected results are revealed.

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Certain of our retroactive reinsurance contracts include asbestos, environmental and other latent injury claims. Our estimate
claims were approximately $14.0 billion at December 31, 2017. We do not consistently receive reliable detailed data regarding asbes
and latent injury claims from all ceding companies, particularly with respect to multi-line or aggregate excess-of-loss policies. Wh
conduct a detailed analysis of the underlying loss data to make an estimate of ultimate reinsured losses. When detailed loss informat
we develop estimates by applying recent industry trends and projections to aggregate client data. Judgments in these areas necessa
stability of the legal and regulatory environment under which we expect these claims will be adjudicated. Legal reform and legislatio
significant impact on our ultimate liabilities.

Changes in ultimate estimated liabilities for prior years' retroactive reinsurance contracts were relatively insignificant in 201
in the estimated timing and amount of remaining unpaid losses. In 2017, we paid losses and loss adjustment expenses of approximate
respect to these contracts.

In connection with our retroactive reinsurance contracts, we also record deferred charge assets, which at contract inceptio
excess, if any, of the estimated ultimate liability for unpaid losses over premiums. We amortize deferred charge assets, which proc
pre-tax earnings in future periods based on the expected timing and amount of loss payments. We also adjust deferred charge balance
the expected timing and ultimate amount of claim payments. Significant changes in such estimates may have a significant effect o
deferred charge balances and the amount of periodic amortization. Based on the contracts in effect as of December 31, 2017, we curr
amortization expense in 2018 will approximate $1.2 billion.

Derivative contract liabilities

We measure derivative contract liabilities at fair value. Our remaining significant derivative contract exposures relate to equ
contracts written between 2004 and 2008. Our recorded liabilities are based on models as there are essentially no observable price
contracts. Actual values in an exchange may differ significantly from the values produced by such models, as transaction values ma
prevailing perceptions of individual buyers and sellers and other changes in market conditions.

We determine the fair values of equity index put option contracts using a Black-Scholes based option valuation model. In
include the current index value, strike price, interest rate, dividend rate and contract expiration date. The weighted average interest a
used as of December 31, 2017 were 1.1% and 3.2%, respectively. The interest rates were approximately 40 basis points (on a weigh
over benchmark interest rates at the end of 2017 and represented our estimate of our nonperformance risk.

The Black-Scholes based model also incorporates volatility inputs that estimate potential price changes over time. Our c
average remaining maturity of about three years. The weighted average volatility used as of December 31, 2017 was approximat
determine the weighted average volatilities based on the volatility input for each contract weighted by the contract's notional value. T
from changes in our volatility assumptions are as follows. (Dollars in millions).

Fair value at December 31, 2017	$2,172
Hypothetical change in volatility	**Hypothetical fair value**
Increase 2 percentage points	$2,332
Increase 4 percentage points	2,502
Decrease 2 percentage points	2,022
Decrease 4 percentage points	1,883

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Other Critical Accounting Policies

Our Consolidated Balance Sheet at December 31, 2017 included goodwill of acquired businesses of $81.3 billion. We eval impairment at least annually and we conducted our most recent annual review during the fourth quarter of 2017. Our review include estimated fair values of our reporting units. There are several methods of estimating a reporting unit's fair value, including mark underlying asset and liability fair value determinations and other valuation techniques, such as discounted projected future net earning and multiples of earnings. We primarily use discounted projected future earnings or cash flow methods. The key assumptions and in methods may include forecasting revenues and expenses, operating cash flows and capital expenditures, as well as an appropriate dis inputs. A significant amount of judgment is required in estimating the fair value of a reporting unit and in performing goodwill impai the inherent uncertainty in forecasting cash flows and earnings, actual results may vary significantly from the forecasts. If the carr reporting unit, including goodwill, exceeds the estimated fair value, then, as required by GAAP, we estimate the fair values of the ide liabilities of the reporting unit. The excess of the estimated fair value of the reporting unit over the estimated fair value of its net ass implied value of goodwill. The excess of the recorded amount of goodwill over the implied goodwill value is charged to earnings as a

Market Risk Disclosures

Our Consolidated Balance Sheets include substantial amounts of assets and liabilities whose fair values are subject to m significant market risks are primarily associated with equity prices, interest rates, foreign currency exchange rates and commodity pri of our investment portfolios and equity index put option contracts remain subject to considerable volatility. The following sectio significant market risks associated with our business activities.

Equity Price Risk

Equity securities represent a significant portion of our investment portfolio. Strategically, we strive to invest in business excellent economics and able and honest management, and we prefer to invest a meaningful amount in each investee. Consequently, are concentrated in relatively few issuers. At December 31, 2017, approximately 65% of the total fair value of equity securities was c issuers.

We often hold our equity investments for long periods and short-term price volatility has occurred in the past and will occu strive to maintain significant levels of shareholder capital and ample liquidity to provide a margin of safety against short-term p

We are also subject to equity price risk with respect to our equity index put option contracts. While our ultimate liability wi contracts is determined from the movement of the underlying stock index between the contract inception date and expiration date, f contracts are also affected by changes in other factors such as interest rates, expected dividend rates and the remaining duration o

The following table summarizes our equity securities and derivative contract liabilities with significant equity price risk as 2017 and 2016 and the estimated effects of a hypothetical 30% increase and a 30% decrease in market prices as of those dates. Th hypothetical increase and decrease does not reflect the best or worst case scenario. Indeed, results from declines could be far wors nature of equity markets and the aforementioned concentrations existing in our equity investment portfolio. Dollar amounts are

	Fair Value	Hypothetical Price Change	Estimated Fair Value after Hypothetical Change in Prices	Hypothetical Percentage Increase (Decrease) in Shareholders' Equity (1)
December 31, 2017				
Investments in equity securities	$ 170,540	30% increase	$ 221,702	11.6 %
		30% decrease	119,378	(11.6)
Equity index put option contract liabilities	2,172	30% increase	1,036	0.3
		30% decrease	4,804	(0.6)
December 31, 2016				
Investments in equity securities	$ 131,629	30% increase	$ 172,341	9.4 %
		30% decrease	91,099	(9.4)
Equity index put option contract liabilities	2,890	30% increase	1,602	0.3
		30% decrease	5,572	(0.6)

(1) *The hypothetical percentage increase (decrease) is after income taxes at the statutory rate in effect as of the balance sheet date.*

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Interest Rate Risk

We may also invest in bonds, loans or other interest rate sensitive instruments. Our strategy is to acquire or originate such ir considered appropriate relative to the perceived credit risk. We recognize and accept that credit losses may occur. We also issue del course of business to fund business operations, business acquisitions and for other general purposes. We strive to maintain high credi minimize the cost of our debt. We rarely utilize derivative products, such as interest rate swaps, to manage interest rate

The fair values of our fixed maturity investments, loans and finance receivables, and notes payable and other borrowings response to changes in market interest rates. In addition, changes in interest rate assumptions used in our equity index put option cor changes in reported liabilities with respect to those contracts. Increases and decreases in interest rates generally translate into decreas fair values of these instruments. Additionally, fair values of interest rate sensitive instruments may be affected by the creditworthir prepayment options, relative values of alternative investments, the liquidity of the instrument and other general market cor

The following table summarizes the estimated effects of hypothetical changes in interest rates on our significant assets and subject to significant interest rate risk at December 31, 2017 and 2016. We assumed that the interest rate changes occur immediately each category of instrument containing interest rate risk, and that there were no significant changes to other factors used to determir instrument. The hypothetical changes in interest rates do not reflect the best or worst case scenarios. Actual results may differ from th table. Dollars are in millions.

		Estimated Fair Value after Hypothetical Change in Interest Rates (bp=basis points)			
	Fair Value	**100 bp decrease**	**100 bp increase**	**200 bp increase**	**300 bp increase**
December 31, 2017					
Assets:					
Investments in fixed maturity securities	$ 21,353	$ 22,053	$ 20,742	$ 20,200	$ 19,717
Loans and finance receivables	14,136	14,655	13,652	13,199	12,774
Liabilities:					
Notes payable and other borrowings:					
Insurance and other	28,180	29,879	26,670	25,319	24,105
Railroad, utilities and energy	70,538	77,091	64,582	59,730	55,581
Finance and financial products	13,582	14,058	13,174	12,821	12,514
Equity index put option contracts	2,172	2,460	1,911	1,676	1,465
December 31, 2016					
Assets:					
Investments in fixed maturity securities	$ 23,432	$ 24,087	$ 22,860	$ 22,395	$ 21,952
Investments in equity securities	7,659	8,095	7,213	6,780	6,367
Loans and finance receivables	13,717	14,230	13,237	12,790	12,370
Liabilities:					
Notes payable and other borrowings:					
Insurance and other	27,712	29,475	26,154	24,770	23,533
Railroad, utilities and energy	65,774	72,261	60,302	55,634	51,624
Finance and financial products	15,825	16,408	15,318	14,872	14,476
Equity index put option contracts	2,890	3,287	2,533	2,213	1,928

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Foreign Currency Risk

Certain of our subsidiaries operate in foreign jurisdictions and we transact business in foreign currencies. In addition, we h common stocks of major multinational companies, such as The Coca-Cola Company, who have significant foreign business and forei their own. We generally do not attempt to match assets and liabilities by currency and do not use derivative contracts to hedge or currency price changes in any meaningful way.

Our net assets subject to financial statement translation into U.S. Dollars are primarily in our insurance, utilities and ene manufacturing and services subsidiaries. This translation related impact may be offset by gains or losses included in net earnings rela of Berkshire and certain of its U.S. subsidiaries that are denominated in foreign currencies, due to changes in exchange rates. A sumr (losses), after-tax, for each of the years ending December 31, 2017 and 2016 follows (in millions).

	2017	2016
Euro-denominated debt included in net earnings	$ (655)	$ 159
Net liabilities under certain reinsurance contracts included in net earnings	(295)	458
Foreign currency translation included in other comprehensive income	2,151	(1,412)

Commodity Price Risk

Our subsidiaries use commodities in various ways in manufacturing and providing services. As such, we are subject to pri various commodities. In most instances, we attempt to manage these risks through the pricing of our products and services to custon that we are unable to sustain price increases in response to commodity price increases, our operating results will likely be adversely utilize derivative contracts to manage a portion of commodity price risks at BHE.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

See "Market Risk Disclosures" contained in Item 7 "Management's Discussion and Analysis of Financial Condition and Resu

Management's Report on Internal Control Over Financial Reporting

Management of Berkshire Hathaway Inc. is responsible for establishing and maintaining adequate internal control over fina such term is defined in the Securities Exchange Act of 1934 Rule 13a-15(f). Under the supervision and with the participation of o including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of the Co control over financial reporting as of December 31, 2017 as required by the Securities Exchange Act of 1934 Rule 13a-15(c). In mak we used the criteria set forth in the framework in *Internal Control—Integrated Framework* (2013) issued by the Committee of Spons of the Treadway Commission. Based on our evaluation under the framework in *Internal Control—Integrated Framework* (2013), concluded that our internal control over financial reporting was effective as of December 31, 2017.

The effectiveness of our internal control over financial reporting as of December 31, 2017 has been audited by Deloitte & independent registered public accounting firm, as stated in their report which appears on page K-61.

Berkshire Hathaway Inc.
February 23, 2018

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Item 8. Financial Statements and Supplementary Data

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Shareholders of
Berkshire Hathaway Inc.
Omaha, Nebraska

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Berkshire Hathaway Inc. and subsidiaries (the "Company") as of and 2016, the related consolidated statements of earnings, comprehensive income, changes in shareholders' equity, and cash flows fo years in the period ended December 31, 2017, and the related notes (collectively referred to as the "financial statements"). We also Company's internal control over financial reporting as of December 31, 2017, based on criteria established in *Internal Control — Inte (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Co December 31, 2017 and 2016, and the results of its operations and its cash flows for each of the three years in the period ended Dec conformity with accounting principles generally accepted in the United States of America. Also, in our opinion, the Company mainta respects, effective internal control over financial reporting as of December 31, 2017, based on criteria established in *Internal Cont Framework (2013)* issued by COSO.

Basis for Opinions

The Company's management is responsible for these financial statements, for maintaining effective internal control over financial re assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on In Financial Reporting. Our responsibility is to express an opinion on these financial statements and an opinion on the Company's int financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversigh States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the a reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud, and w internal control over financial reporting was maintained in all material respects.

Our audits of the financial statements included performing procedures to assess the risks of material misstatement of the financial st due to error or fraud, and performing procedures to respond to those risks. Such procedures included examining, on a test basis, evid amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significa by management, as well as evaluating the overall presentation of the financial statements. Our audit of internal control over financial obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other p considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliabi reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting princip internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, an expenditures of the company are being made only in accordance with authorizations of management and directors of the company reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's asse material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projection of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or compliance with the policies or procedures may deteriorate.

/s/ Deloitte & Touche LLP

Omaha, Nebraska
February 23, 2018

We have served as the Company's auditor since 1985.

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BERKSHIRE HATHAWAY INC.
and Subsidiaries

CONSOLIDATED BALANCE SHEETS
(dollars in millions)

	December 31, 2017	December 31, 2016
ASSETS		
Insurance and Other:		
Cash and cash equivalents	$ 25,460	$ 23,581
Short-term investments in U.S. Treasury Bills	78,515	47,338
Investments in fixed maturity securities	21,353	23,432
Investments in equity securities	164,026	134,835
Investments in The Kraft Heinz Company (Fair Value: 2017 – $25,306; 2016 – $28,418)	17,635	15,345
Receivables	28,578	27,097
Inventories	16,187	15,727
Property, plant and equipment	20,104	19,325
Goodwill	54,985	53,994
Other intangible assets	32,518	33,481
Deferred charges under retroactive reinsurance contracts	15,278	8,047
Other	11,158	7,126
	485,797	409,328
Railroad, Utilities and Energy:		
Cash and cash equivalents	2,910	3,939
Property, plant and equipment	128,184	123,759
Goodwill	24,780	24,111
Regulatory assets	2,950	4,457
Other	15,589	13,550
	174,413	169,816
Finance and Financial Products:		
Cash and cash equivalents	3,213	528
Short-term investments in U.S. Treasury Bills	5,856	10,984
Loans and finance receivables	13,748	13,300
Property, plant and equipment and assets held for lease	9,931	9,689
Goodwill	1,493	1,381
Other	7,644	5,828
	41,885	41,710
	$ 702,095	$ 620,854

See accompanying Notes to Consolidated Financial Statements

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BERKSHIRE HATHAWAY INC.
and Subsidiaries

CONSOLIDATED BALANCE SHEETS
(dollars in millions)

	December 31, 2017	December 31, 2016
LIABILITIES AND SHAREHOLDERS' EQUITY		
Insurance and Other:		
Unpaid losses and loss adjustment expenses	$ 61,122	$ 53,379
Unpaid losses and loss adjustment expenses under retroactive reinsurance contracts	42,937	24,972
Unearned premiums	16,040	14,245
Life, annuity and health insurance benefits	17,608	15,977
Other policyholder liabilities	7,654	6,714
Accounts payable, accruals and other liabilities	23,099	22,164
Notes payable and other borrowings	27,324	27,175
	195,784	164,626
Railroad, Utilities and Energy:		
Accounts payable, accruals and other liabilities	11,334	11,434
Regulatory liabilities	7,511	3,121
Notes payable and other borrowings	62,178	59,085
	81,023	73,640
Finance and Financial Products:		
Accounts payable, accruals and other liabilities	1,470	1,444
Derivative contract liabilities	2,172	2,890
Notes payable and other borrowings	13,085	15,384
	16,727	19,718
Income taxes, principally deferred	56,607	77,442
Total liabilities	350,141	335,426
Shareholders' equity:		
Common stock	8	8
Capital in excess of par value	35,694	35,681
Accumulated other comprehensive income	58,571	37,298
Retained earnings	255,786	210,846
Treasury stock, at cost	(1,763)	(1,763)
Berkshire Hathaway shareholders' equity	348,296	282,070
Noncontrolling interests	3,658	3,358
Total shareholders' equity	351,954	285,428
	$ 702,095	$ 620,854

See accompanying Notes to Consolidated Financial Statements

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BERKSHIRE HATHAWAY INC.
and Subsidiaries

CONSOLIDATED STATEMENTS OF EARNINGS
(dollars in millions except per-share amounts)

	Year Ended December 31,		
	2017	**2016**	**2**
Revenues:			
Insurance and Other:			
Insurance premiums earned	$ 60,597	$ 45,881	$
Sales and service revenues	125,963	119,489	10
Interest, dividend and other investment income	5,144	4,725	5
Investment gains/losses	1,202	5,128	9
	192,906	175,223	16
Railroad, Utilities and Energy operating and other revenues	39,943	37,542	40
Finance and Financial Products:			
Sales and service revenues	6,924	6,208	5
Interest, dividend and other investment income	1,438	1,455	1
Investment gains/losses	208	2,425	
Derivative contract gains/losses	718	751	
	9,288	10,839	7
Total revenues	242,137	223,604	21
Costs and expenses:			
Insurance and Other:			
Insurance losses and loss adjustment expenses	48,891	30,906	20
Life, annuity and health insurance benefits	5,618	5,131	5
Insurance underwriting expenses	9,321	7,713	7
Cost of sales and services	101,748	95,754	87
Selling, general and administrative expenses	16,241	16,478	1
Interest expense	1,740	445	
	183,559	156,427	14
Railroad, Utilities and Energy:			
Cost of sales and operating expenses	28,034	26,194	27
Interest expense	3,254	2,642	2
	31,288	28,836	30
Finance and Financial Products:			
Cost of sales and services	4,050	3,448	2
Selling, general and administrative expenses	1,940	1,739	1
Interest expense	400	410	
	6,390	5,597	4
Total costs and expenses	221,237	190,860	17
Earnings before income taxes and equity in earnings of The Kraft Heinz Company	20,900	32,744	3
Equity in earnings (loss) of The Kraft Heinz Company	2,938	923	(
Earnings before income taxes	23,838	33,667	34
Income tax expense (benefit)	(21,515)	9,240	10
Net earnings	45,353	24,427	24
Earnings attributable to noncontrolling interests	413	353	
Net earnings attributable to Berkshire Hathaway shareholders	$ 44,940	$ 24,074	$

Net earnings per average equivalent Class A share	$	27,326	$	14,645	$	
Net earnings per average equivalent Class B share*	$	18.22	$	9.76	$	
Average equivalent Class A shares outstanding		1,644,615		1,643,826		1,6
Average equivalent Class B shares outstanding		2,466,923,163		2,465,739,654		2,464

** Net earnings per average equivalent Class B share outstanding are one-fifteen-hundredth of the equivalent Class A ar*

See accompanying Notes to Consolidated Financial Statements

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BERKSHIRE HATHAWAY INC.
and Subsidiaries

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

(dollars in millions)

	Year Ended December 31,		
	2017	2016	2015
Net earnings	$45,353	$ 24,427	$ 24,414
Other comprehensive income:			
Net change in unrealized appreciation of investments	30,450	13,858	(8,520)
Applicable income taxes	(10,566)	(4,846)	3,014
Reclassification of investment appreciation in net earnings	(1,399)	(6,820)	(2,332)
Applicable income taxes	490	2,387	816
Foreign currency translation	2,364	(1,541)	(1,931)
Applicable income taxes	(95)	66	(43)
Prior service cost and actuarial gains/losses of defined benefit pension plans	225	354	424
Applicable income taxes	(45)	(187)	(140)
Other, net	(9)	(17)	(94)
Other comprehensive income, net	21,415	3,254	(8,806)
Comprehensive income	66,768	27,681	15,608
Comprehensive income attributable to noncontrolling interests	555	291	275
Comprehensive income attributable to Berkshire Hathaway shareholders	$66,213	$ 27,390	$ 15,333

CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY

(dollars in millions)

	Berkshire Hathaway shareholders' equity					
	Common stock and capital in excess of par value	Accumulated other comprehensive income	Retained earnings	Treasury stock	Non-controlling interests	Total
Balance December 31, 2014	$ 35,581	$42,732	$ 162,689	$ (1,763)	$ 2,857	$ 242,096
Net earnings	—	—	24,083	—	331	24,414
Other comprehensive income, net	—	(8,750)	—	—	(56)	(8,806
Issuance of common stock	53	—	—	—	—	53
Transactions with noncontrolling interests	(6)	—	—	—	(55)	(61
Balance December 31, 2015	35,628	33,982	186,772	(1,763)	3,077	257,696
Net earnings	—	—	24,074	—	353	24,427
Other comprehensive income, net	—	3,316	—	—	(62)	3,254
Issuance of common stock	119	—	—	—	—	119
Transactions with noncontrolling interests	(58)	—	—	—	(10)	(68
Balance December 31, 2016	35,689	37,298	210,846	(1,763)	3,358	285,428
Net earnings	—	—	44,940	—	413	45,353
Other comprehensive income, net	—	21,273	—	—	142	21,415
Issuance of common stock	76	—	—	—	—	76
Transactions with noncontrolling interests	(63)	—	—	—	(255)	(318
Balance December 31, 2017	$ 35,702	$58,571	$ 255,786	$ (1,763)	$ 3,658	$ 351,954

See accompanying Notes to Consolidated Financial Statements

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BERKSHIRE HATHAWAY INC.
and Subsidiaries
CONSOLIDATED STATEMENTS OF CASH FLOWS
(dollars in millions)

	Year Ended December 31,		
	2017	2016	2015
Cash flows from operating activities:			
Net earnings	$ 45,353	$ 24,427	$ 24,414
Adjustments to reconcile net earnings to operating cash flows:			
Investment gains/losses	(1,410)	(7,553)	(9,373)
Depreciation and amortization	9,188	8,901	7,779
Other	458	(161)	751
Changes in operating assets and liabilities:			
Losses and loss adjustment expenses	25,027	4,372	2,262
Deferred charges reinsurance assumed	(7,231)	(360)	84
Unearned premiums	1,761	968	1,392
Receivables and originated loans	(1,990)	(3,302)	(1,650)
Derivative contract assets and liabilities	(775)	(946)	(974)
Income taxes	(24,957)	4,044	5,718
Other	352	2,145	1,088
Net cash flows from operating activities	45,776	32,535	31,491
Cash flows from investing activities:			
Purchases of U.S. Treasury Bills and fixed maturity securities	(158,492)	(96,568)	(17,891)
Purchases of equity securities	(20,326)	(16,508)	(10,220)
Purchase of Kraft Heinz common stock	—	—	(5,258)
Sales of U.S. Treasury Bills and fixed maturity securities	49,327	18,757	2,471
Redemptions and maturities of U.S. Treasury Bills and fixed maturity securities	86,727	26,177	14,656
Sales and redemptions of equity securities	19,512	28,464	8,747
Purchases of loans and finance receivables	(1,435)	(307)	(179)
Collections of loans and finance receivables	1,702	490	492
Acquisitions of businesses, net of cash acquired	(2,708)	(31,399)	(4,902)
Purchases of property, plant and equipment	(11,708)	(12,954)	(16,082)
Other	(3,690)	(419)	165
Net cash flows from investing activities	(41,091)	(84,267)	(28,001)
Cash flows from financing activities:			
Proceeds from borrowings of insurance and other businesses	1,342	9,431	3,358
Proceeds from borrowings of railroad, utilities and energy businesses	3,013	3,077	5,479
Proceeds from borrowings of finance businesses	1,303	4,741	1,045
Repayments of borrowings of insurance and other businesses	(1,856)	(1,264)	(1,916)
Repayments of borrowings of railroad, utilities and energy businesses	(3,549)	(2,123)	(1,725)
Repayments of borrowings of finance businesses	(3,609)	(1,313)	(1,827)
Changes in short term borrowings, net	2,079	130	(378)
Other	(121)	112	(233)
Net cash flows from financing activities	(1,398)	12,791	3,803
Effects of foreign currency exchange rate changes	248	(172)	(165)
Increase (decrease) in cash and cash equivalents	3,535	(39,113)	7,128
Cash and cash equivalents at beginning of year	28,048	67,161	60,033
Cash and cash equivalents at end of year *	$ 31,583	$ 28,048	$ 67,161
** Cash and cash equivalents at end of year are comprised of the following:*			
Insurance and Other	*$ 25,460*	*$ 23,581*	*$ 56,612*

Railroad, Utilities and Energy	*2,910*	*3,939*	*3,437*
Finance and Financial Products	*3,213*	*528*	*7,112*
	$ 31,583	*$ 28,048*	*$ 67,161*

See accompanying Notes to Consolidated Financial Statements

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BERKSHIRE HATHAWAY INC.
and Subsidiaries

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
December 31, 2017

(1) Significant accounting policies and practices

(a) Nature of operations and basis of consolidation

Berkshire Hathaway Inc. ("Berkshire") is a holding company owning subsidiaries engaged in a number of diverse b including insurance and reinsurance, freight rail transportation, utilities and energy, manufacturing, service, retailing a notes the terms "us," "we," or "our" refer to Berkshire and its consolidated subsidiaries. Further information regardi business segments is contained in Note 23. Significant business acquisitions completed over the past three years are d

The accompanying Consolidated Financial Statements include the accounts of Berkshire consolidated with the a subsidiaries and affiliates in which we hold a controlling financial interest as of the financial statement date. Norma financial interest reflects ownership of a majority of the voting interests. We consolidate a variable interest entity (possess both the power to direct the activities of the VIE that most significantly impact its economic performance a obligated to absorb the losses that could potentially be significant to the VIE or we hold the right to receive benefits could potentially be significant to the VIE. Intercompany accounts and transactions have been elimina

Prior to 2017, the liability for unpaid losses and loss adjustment expenses related to workers' compensation claims ass workers' compensation reinsurance contracts were discounted for the time-value-of-money consistent with insur accounting principles. Estimated claim liabilities assumed under all other insurance and reinsurance contracts, includ compensation contracts are not discounted. In the fourth quarter of 2017, we discontinued the practice of discou compensation claims liabilities assumed under all reinsurance contracts to achieve full consistency. In connection wi increased our unpaid losses and loss adjustment expenses by $1.43 billion and reduced our income tax liabilities by $ shareholders' equity by $931 million. The effect of this change on net earnings in 2015 and 2016 was immaterial and adjustment to retained earnings was recorded as of December 31, 2014 in the accompanying Consolidated Financial result, retained earnings and shareholder's equity for the years 2014-2016 have been restated from the amounts pre

(b) Use of estimates in preparation of financial statements

The preparation of our Consolidated Financial Statements in conformity with accounting principles generally accep States ("GAAP") requires us to make estimates and assumptions that affect the reported amounts of assets and liabiliti financial statements and the reported amounts of revenues and expenses during the period. In particular, estimates of loss adjustment expenses and related reinsurance recoverable on unpaid losses are subject to considerable estimatio inherent uncertainty in projecting ultimate claim costs. In addition, estimates and assumptions associated with the deferred charges on retroactive reinsurance contracts, determinations of fair values of certain financial instruments a goodwill and identifiable intangible assets for impairment require considerable judgment. Actual results may differ f used in preparing our Consolidated Financial Statements.

(c) Cash and cash equivalents and Short-term investments in U.S. Treasury Bills

Cash equivalents consist of demand deposit and money market accounts and investments with maturities of three mo purchased. Short-term investments in U.S. Treasury Bills have remaining maturities exceeding three months at the tin are stated at amortized cost. Our aggregate investments in U.S. Treasury Bills at December 31, 2017 were $90.1 billio of $5.7 billion included in cash and cash equivalents and $84.4 billion included in short-term investments in U.S. Tr Consolidated Balance Sheet.

(d) Investments in fixed maturity and equity securities

We classify investments in fixed maturity and equity securities at the acquisition date and re-evaluate the classificati sheet date. Investments classified as held-to-maturity are carried at amortized cost, reflecting the ability and intent to to maturity. Trading investments are securities acquired with the intent to sell in the near term and are carried at fair in fair value reported in earnings. All other securities are classified as available-for-sale and are carried at fair value gains or losses reported as a component of accumulated other comprehensive income. As of December 31, 2017, sub investments in equity and fixed maturity securities were classified as available-for-sale.

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(1) Significant accounting policies and practices *(Continued)*

(d) Investments in fixed maturity and equity securities (Continued)

Investment gains and losses arise when investments are sold (as determined on a specific identification basis) or a temporarily impaired. If a decline in the value of an investment below cost is deemed other than temporary, the cost c written down to fair value, with a corresponding charge to earnings. Factors considered in determining whether an ir than temporary include: the financial condition, business prospects and creditworthiness of the issuer, the relative am our ability and intent to hold the investment until the fair value recovers and the length of time that fair value has be With respect to an investment in a fixed maturity security, we recognize an other-than-temporary impairment if we (a expect to be required to sell the security before its amortized cost is recovered or (b) do not expect to ultimately reco cost basis even if we do not intend to sell the security. Under scenario (a), we recognize the loss in earnings and unde recognize the credit loss component in earnings and the difference between fair value and the amortized cost basis net other comprehensive income.

(e) Investments under the equity method

We utilize the equity method to account for investments when we possess the ability to exercise significant influenc over the operating and financial policies of the investee. The ability to exercise significant influence is presumed w possesses more than 20% of the voting interests of the investee. This presumption may be overcome based on spe circumstances that demonstrate that the ability to exercise significant influence is restricted. We apply the equity met in common stock and to other investments when such other investments possess substantially identical subordinated i stock.

In applying the equity method, we record the investment at cost and subsequently increase or decrease the carryin investment by our proportionate share of the net earnings or losses and other comprehensive income of the investee. W or other equity distributions as reductions in the carrying value of the investment. In the event that net losses of the i carrying amount to zero, additional net losses may be recorded if other investments in the investee are at-risk, even committed to provide financial support to the investee. Such additional equity method losses, if any, are based upon claim on the investee's book value.

(f) Receivables, loans and finance receivables

Receivables of the insurance and other businesses are stated net of estimated allowances for uncollectible balances uncollectible balances are provided when it is probable counterparties or customers will be unable to pay all amount contractual terms. Receivables are generally written off against allowances after all reasonable collection efforts

Loans and finance receivables of the finance and financial products businesses are predominantly manufactured ho loans. These loans are stated at amortized cost based on our ability and intent to hold such loans to maturity and a allowances for uncollectible accounts. The carrying value of acquired loans represents acquisition costs, plus or min commitment costs paid or fees received, which together with acquisition premiums or discounts, are deferred and a adjustments over the life of the loans. Substantially all of these loans are secured by real or personal property or ot borrower.

Allowances for credit losses on loans include estimates of losses on loans currently in foreclosure and losses on loan foreclosure. Estimates of losses on loans in foreclosure are based on historical experience and collateral recovery ra losses on loans not currently in foreclosure consider historical default rates, collateral recovery rates and prevailing ec Allowances for credit losses also incorporate the historical average time elapsed from the last payment until f

Loans are considered delinquent when payments are more than 30 days past due. Loans over 90 days past due are pla status and accrued but uncollected interest is reversed. Subsequent collections on the loans are first applied to the pri owed for the most delinquent amount. Interest income accruals resume once a loan is less than 90 days del

Loans in the foreclosure process are considered non-performing. Once a loan is in foreclosure, interest income is not the foreclosure is cured or the loan is modified. Once a modification is complete, interest income is recognized based new loan. Foreclosed loans are charged off when the collateral is sold. Loans not in foreclosure are evaluated for ch individual circumstances concerning the future collectability of the loan and the condition of the collateral secu

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(1) Significant accounting policies and practices *(Continued)*

(g) Derivatives

We carry derivative contracts in our Consolidated Balance Sheets at fair value, net of reductions permitted under agreements with counterparties. The changes in fair value of derivative contracts that do not qualify as hedging instru reporting purposes are recorded in earnings or by our regulated utilities businesses as regulatory assets or liabilities, a inclusion in regulated rates is probable.

(h) Fair value measurements

As defined under GAAP, fair value is the price that would be received to sell an asset or paid to transfer a liability participants in the principal market or in the most advantageous market when no principal market exists. Adjustmen prices or quoted market prices may be required in illiquid or disorderly markets in order to estimate fair value. Alte techniques may be appropriate under the circumstances to determine the value that would be received to sell an asset liability in an orderly transaction. Market participants are assumed to be independent, knowledgeable, able and will exchange and not acting under duress. Our nonperformance or credit risk is considered in determining the fair val Considerable judgment may be required in interpreting market data used to develop the estimates of fair value. Accor fair value presented herein are not necessarily indicative of the amounts that could be realized in a current or future

(i) Inventories

Inventories consist of manufactured goods and goods acquired for resale. Manufactured inventory costs include raw m indirect labor and factory overhead. As of December 31, 2017, approximately 41% of our consolidated inventory co using the last-in-first-out ("LIFO") method, with the remainder determined under first-in-first-out and average cost m inventories are stated at the lower of cost or net realizable value. The difference between costs determined under LIF was not material as of December 31, 2017.

(j) Property, plant and equipment and leased assets

Additions to property, plant and equipment used in operations and leased assets are recorded at cost and consist improvements and betterments. With respect to constructed assets, all construction related material, direct labor and c well as certain indirect costs are capitalized. Indirect costs include interest over the construction period. With respe assets of our regulated utility and energy subsidiaries that are subject to authoritative guidance for regulated operation also include an equity allowance for funds used during construction, which represents the cost of equity funds use construction of the regulated facilities. Also see Note 1(r).

Normal repairs and maintenance and other costs that do not improve the property, extend the useful life or otherw capitalization criteria are charged to expense as incurred. Rail grinding costs related to our railroad properties are exp

Depreciation of assets of our regulated utilities and railroad is generally determined using group depreciation metho based on periodic depreciation studies approved by the applicable regulator. Under group depreciation, a single dep applied to the gross investment in a particular class of property, despite differences in the service life or salvage va property units within the same class. When our regulated utilities or railroad retires or sells a component of the assets group depreciation methods, no gain or loss is recognized. Gains or losses on disposals of all other assets are recorde Ranges of estimated useful lives of depreciable assets unique to our railroad business are as follows: track structure a 9 to 100 years, locomotives, freight cars and other equipment – 6 to 41 years. Ranges of estimated useful lives of as regulated utilities and energy businesses are as follows: utility generation, transmission and distribution systems - interstate natural gas pipeline assets – 3 to 80 years and independent power plants and other assets – 3 to 3

Property, plant and equipment and leased assets in use by our other businesses are depreciated to estimated salvage va the straight-line method over estimated useful lives. Ranges of estimated useful lives of depreciable assets used in ou are as follows: buildings and improvements – 5 to 50 years, machinery and equipment – 3 to 25 years, furniture, fixtu 15 years and assets held for lease – 6 to 35 years.

We evaluate property, plant and equipment for impairment when events or changes in circumstances indicate that the such assets may not be recoverable or when the assets are held for sale. Upon the occurrence of a triggering event, we estimated undiscounted cash flows expected from the use of the asset and the residual value from the ultimate disp exceeds the carrying value. If the carrying value exceeds the estimated recoverable amounts, we reduce the carrying and record an impairment loss in earnings, except with respect to impairment of assets of our regulated utility and en when the impacts of regulation are considered in evaluating the carrying value of regulated assets.

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(1) Significant accounting policies and practices *(Continued)*

(k) Goodwill and other intangible assets

Goodwill represents the excess of the acquisition price of a business over the fair value of identified net assets of t
evaluate goodwill for impairment at least annually. When evaluating goodwill for impairment, we estimate the fair va
unit. There are several methods that may be used to estimate a reporting unit's fair value, including market quotations
fair values and other valuation techniques, including, but not limited to, discounted projected future net earnings or r
multiples of earnings. If the carrying amount of a reporting unit, including goodwill, exceeds the estimated fair v
identifiable assets and liabilities of the reporting unit are estimated at fair value as of the current testing date. The exc
fair value of the reporting unit over the current estimated fair value of net assets establishes the implied value of good
the recorded goodwill over the implied goodwill value is charged to earnings as an impairment loss. Significant judg
estimating the fair value of the reporting unit and performing goodwill impairment tests.

Intangible assets with finite lives are amortized based on the estimated pattern in which the economic benefits are
consumed or on a straight-line basis over their estimated economic lives. Intangible assets with finite lives are review
when events or changes in circumstances indicate that the carrying amount may not be recoverable. Intangible assets v
are tested for impairment at least annually and when events or changes in circumstances indicate that it is more likel
asset is impaired.

(l) Revenue recognition

Insurance premiums for prospective property/casualty insurance and reinsurance are earned over the loss exposure or
proportion to the level of protection provided. In most cases, such premiums are recognized as revenues ratably ov
contract with unearned premiums computed on a monthly or daily pro-rata basis. Premiums for retroactive property/c
contracts are earned at the inception of the contracts, as all of the underlying loss events covered by these policies o
inception. Premiums for life reinsurance and annuity contracts are earned when due. Premiums earned are stated net o
reinsurers. Premiums earned on contracts containing experience rating provisions reflect estimated loss experience

Sales revenues derive from the sales of manufactured products and goods acquired for resale. Revenues from sales ar
passage of title to the customer, which generally coincides with customer pickup, product delivery or acceptance, dep
the sales arrangement.

Service revenues are recognized as the services are performed. Services provided pursuant to a contract are either re
contract period or upon completion of the elements specified in the contract depending on the terms of the contract. F
the sales of fractional ownership interests in aircraft are recognized ratably over the term of the related management s
as the transfer of ownership interest in the aircraft is inseparable from the management services agreem

Leasing revenue is generally recognized ratably over the term of the lease. A substantial portion of our leases are clas
leases.

Operating revenues from the distribution and sale of electricity and natural gas to customers are recognized when
rendered or the energy is delivered. Revenues include unbilled as well as billed amounts. Rates charged are generally
and state regulation or established under contractual arrangements. When preliminary rates are permitted to be bill
approval by the applicable regulator, certain revenue collected may be subject to refund and a liability for estimated r

Railroad transportation revenues are recognized based upon the proportion of service provided as of the balance she
incentives, which are primarily provided for shipping a specified cumulative volume or shipping to/from specific loca
as pro-rata reductions to revenue based on actual or projected future customer shipments. When using projected ship
historic trends as well as economic and other indicators to estimate the recorded liability for customer inc

(m) Losses and loss adjustment expenses

We record liabilities for unpaid losses and loss adjustment expenses assumed under short duration property/casual
reinsurance contracts for loss events that have occurred on or before the balance sheet date. Such liabilities represe
ultimate payment amounts without discounting for time value.

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Notes to Consolidated Financial Statements *(Continued)*

(1) Significant accounting policies and practices *(Continued)*

(m) Losses and loss adjustment expenses (Continued)

Liability estimates are based upon (1) reports of losses from policyholders, (2) individual case estimates and (3) estim not reported losses. Paid claims, claim settlement costs and changes in estimated claim liabilities are included in adjustment expenses in the Consolidated Statements of Earnings. Provisions for losses and loss adjustment expens earnings after deducting amounts recovered and estimates of recoverable amounts under ceded reinsurance contra contracts do not relieve the ceding company of its obligations to indemnify policyholders with respect to the underly reinsurance contracts.

(n) Retroactive reinsurance contracts

We record liabilities for unpaid losses and loss adjustment expenses assumed under retroactive reinsurance of short consistent with other short duration property/casualty insurance and reinsurance contracts discussed in Note 1(m). retroactive reinsurance contracts, we also record deferred charge assets at the inception of the contracts, representing t the estimated ultimate claim liabilities over the premiums earned. We subsequently amortize the deferred charge asse method over the expected claim settlement periods. Changes to the estimated timing or amount of future loss paym changes in deferred charge balances. Changes in such estimates are applied retrospectively and the resulting changes balances, together with periodic amortization, are included in insurance losses and loss adjustment expenses in th Statements of Earnings.

(p) Insurance policy acquisition costs

Incremental costs that are directly related to the successful sale of insurance contracts are capitalized, subject to ultin and are subsequently amortized to underwriting expenses as the related premiums are earned. Direct incremental a include commissions, premium taxes and certain other costs associated with successful efforts. All other underwriting as incurred. The recoverability of capitalized insurance policy acquisition costs generally reflects anticipation of inve unamortized balances are included in other assets and were $2,529 million and $1,991 million at December 31, 2 respectively.

(q) Life and annuity insurance benefits

Liabilities for insurance benefits under life contracts are computed based upon estimated future investment yields, e morbidity, and lapse or withdrawal rates and reflect estimates for future premiums and expenses under the contracts. as applicable, also include a margin for adverse deviation and may vary with the characteristics of the contract's date duration and country of risk. The interest rate assumptions used may vary by contract or jurisdiction. Periodic payme are discounted based on the implicit rate as of the inception of the contracts such that the present value of the liabi premiums. Discount rates range from less than 1% to 7%.

(r) Regulated utilities and energy businesses

Certain energy subsidiaries prepare their financial statements in accordance with authoritative guidance for regul reflecting the economic effects of regulation from the ability to recover certain costs from customers and the requi revenues to customers in the future through the regulated rate-setting process. Accordingly, certain costs are deferred and certain income is accrued as regulatory liabilities. Regulatory assets and liabilities will be amortized into opera revenues over various future periods.

Regulatory assets and liabilities are continually assessed for probable future inclusion in regulatory rates by consider applicable regulatory or legislative changes and recent rate orders received by other regulated entities. If future inclu rates ceases to be probable, the amount no longer probable of inclusion in regulatory rates is charged or credited to comprehensive income, if applicable) or returned to customers.

(s) Foreign currency

The accounts of our non-U.S. based subsidiaries are measured, in most instances, using functional currencies other th Revenues and expenses of these subsidiaries are translated into U.S. Dollars at the average exchange rate for the per liabilities are translated at the exchange rate as of the end of the reporting period. Gains or losses from translating the of these subsidiaries are included in shareholders' equity as a component of accumulated other comprehensive incom arising from transactions denominated in a currency other than the functional currency of the reporting entity, includi from the remeasurement of assets and liabilities due to changes in exchange rates, are included in earni

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(1) Significant accounting policies and practices *(Continued)*

(t) Income taxes

Berkshire files a consolidated federal income tax return in the United States, which includes eligible subsidiaries. In income tax returns in state, local and foreign jurisdictions as applicable. Provisions for current income tax liabilities accrued on income and expense amounts expected to be included in the income tax returns for the current year. Incom earnings also include deferred income tax provisions.

Deferred income tax assets and liabilities are computed on differences between the financial statement bases and tax liabilities at the enacted tax rates. Changes in deferred income tax assets and liabilities associated with compon comprehensive income are charged or credited directly to other comprehensive income. Otherwise, changes in deferre and liabilities are included as a component of income tax expense. The effect on deferred income tax assets and liabil changes in enacted tax rates are charged or credited to income tax expense in the period of enactment. Valuation established for certain deferred tax assets when realization is not likely.

Assets and liabilities are established for uncertain tax positions taken or positions expected to be taken in income tax positions, in our judgment, do not meet a "more-likely-than-not" threshold based on the technical merits of the pos interest and penalties related to uncertain tax positions are included as a component of income tax expe

(u) New accounting pronouncements to be adopted subsequent to December 31, 2017

The Financial Accounting Standards Board ("FASB") issued ASU 2016-01 "Financial Instruments—Recognition an Financial Assets and Financial Liabilities" in 2016, which requires that investments in equity securities (excluding investments) be measured at fair value with changes in fair value recognized in net earnings. Under existing GAAP, c of available-for-sale equity securities are recorded in other comprehensive income. Given the magnitude of our inve securities and the inherent volatility of prices for equity securities, the adoption of ASU 2016-01 will have a signific future reported net earnings, although it will not affect our comprehensive income or total shareholders' equity. W 2016-01 as of January 1, 2018. As of that date, we reclassified the accumulated net unrealized appreciation relating to equity securities at December 31, 2017 (approximately $61.5 billion) from accumulated other comprehensive inc earnings.

The FASB issued ASU 2014-09 "Revenue from Contracts with Customers" in 2014. ASU 2014-09 applies to contrac excluding, most notably, insurance, reinsurance and leasing contracts. Subsequently the FASB issued additional guid or clarified ASU 2014-09. All guidance is collectively referred to as Accounting Standard Codification ("ASC") 60 prescribed by ASC 606 includes a five-step process for recognizing revenue. A core principle is that revenues are r control of distinct goods or services are transferred to customers in amounts that reflect the consideration the seller ex Under ASC 606, revenues and related costs with respect to certain of our contracts with customers will be recognize than when the products or services are delivered. In addition, certain of our contracts will be treated as leases for acc rather than contracts with customers subject to ASC 606. We adopted ASC 606 as of January 1, 2018, under the mod method. The principal impact of the initial adoption of ASC 606 resulted in an increase to both assets (primarily pr equipment) and liabilities of approximately $3.5 billion.

In 2016, the FASB issued ASU 2016-02 "Leases." ASU 2016-02 requires a lessee to recognize in the statement of fi liability to make lease payments and a right-of-use asset representing its right to use the underlying asset for the lea requires additional qualitative and quantitative disclosures. ASU 2016-02 is effective for reporting periods beginning 2018, with early adoption permitted. We are currently evaluating the effect this standard will have on our Consoli Statements.

In 2016, the FASB issued ASU 2016-13 "Financial Instruments—Credit Losses," which provides for the recognition a the reporting date of all expected credit losses for financial assets held at amortized cost and available-for-sale debt se credit losses are recognized and measured when such losses become probable based on the prevailing facts and circ 2016-13 is effective for reporting periods beginning after December 15, 2019. We are currently evaluating the effect have on our Consolidated Financial Statements.

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(1) Significant accounting policies and practices *(Continued)*

(u) New accounting pronouncements to be adopted subsequent to December 31, 2017 (Continued)

In January 2017, the FASB issued ASU 2017-04 "Simplifying the Test for Goodwill Impairment." ASU 2017-04 requirement to determine the implied value of goodwill in measuring an impairment loss. Upon adoption, the measure impairment will represent the excess of the reporting unit's carrying value over fair value, limited to the carrying valu 2017-04 is effective for goodwill impairment tests in fiscal years beginning after December 15, 2019, with early ad

(2) Significant business acquisitions

Our long-held acquisition strategy is to acquire businesses that have consistent earning power, good returns on equity anc management. Financial results attributable to business acquisitions are included in our Consolidated Financial Statements beginning acquisition dates.

On January 29, 2016, Berkshire acquired all outstanding common stock of Precision Castparts Corp. ("PCC") for $235 p pursuant to a definitive merger agreement dated August 8, 2015. The aggregate consideration paid was approximately $32.7 billion, value of PCC shares we already owned. We funded the acquisition with a combination of existing cash balances and proceeds from facility. PCC is a worldwide, diversified manufacturer of complex metal components and products, serving the aerospace, power anc markets. PCC manufactures complex structural investment castings and forged components for aerospace markets, machined airfran highly engineered critical fasteners for aerospace applications, and in manufacturing airfoil castings for the aerospace and industrial g PCC also produces titanium and nickel superalloy melted and mill products for the aerospace, chemical processing, oil and gas and industries, and manufactures extruded seamless pipe, fittings and forgings for power generation and oil and gas applica

On February 29, 2016, we acquired a recapitalized Duracell Company ("Duracell") from The Procter & Gamble Compa exchange for shares of P&G common stock held by Berkshire subsidiaries, which had a fair value of approximately $4.2 billion. Du high-performance alkaline batteries and wireless charging technologies. Goodwill from these acquisitions is not amortizable for inc The fair values of identified assets acquired and liabilities assumed and residual goodwill at their respective acquisition dates are sum (in millions).

	PCC	Duracell
Cash and cash equivalents	$ 250	$ 1,807
Inventories	3,430	319
Property, plant and equipment	2,765	359
Goodwill	16,011	866
Other intangible assets	23,527	1,550
Other assets	1,916	242
Assets acquired	$ 47,899	$ 5,143
Accounts payable, accruals and other liabilities	$ 2,442	$ 410
Notes payable and other borrowings	5,251	—
Income taxes, principally deferred	7,548	494
Liabilities assumed	$ 15,241	$ 904
Net assets	$ 32,658	$ 4,239

In the first quarter of 2015, we acquired the Van Tuyl Group (now named Berkshire Hathaway Automotive), which inc automotive dealerships and two related insurance businesses, two auto auctions and a distributor of automotive fluid maintenance pr to selling new and pre-owned automobiles, the Berkshire Hathaway Automotive group offers repair and other services and products, warranty services and other automotive protection plans. Consideration paid for the acquisition was $4.1 billion. The goodwill rela Hathaway Automotive is amortizable for income tax purposes.

Over the three years ending December 31, 2017, we completed several smaller-sized business acquisitions, most of whic "bolt-on" acquisitions to several of our existing business operations. Aggregate consideration paid in 2017, 2016 and 2015 for bolt-c approximately $2.7 billion, $1.4 billion and $1.1 billion, respectively. We do not believe that these acquisitions are material, indiv aggregate to our Consolidated Financial Statements.

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(3) Investments in fixed maturity securities

Investments in fixed maturity securities as of December 31, 2017 and 2016 are summarized by type below (in m

	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
December 31, 2017				
U.S. Treasury, U.S. government corporations and agencies	$ 3,975	$ 4	$ (26)	$ 3,953
States, municipalities and political subdivisions	847	19	(12)	854
Foreign governments	8,572	274	(24)	8,822
Corporate bonds	6,279	588	(5)	6,862
Mortgage-backed securities	772	92	(2)	862
	$ 20,445	$ 977	$ (69)	$ 21,353
December 31, 2016				
U.S. Treasury, U.S. government corporations and agencies	$ 4,519	$ 16	$ (8)	$ 4,527
States, municipalities and political subdivisions	1,159	58	(1)	1,216
Foreign governments	8,860	207	(66)	9,001
Corporate bonds	6,899	714	(9)	7,604
Mortgage-backed securities	967	123	(6)	1,084
	$ 22,404	$ 1,118	$ (90)	$ 23,432

Investments in foreign government securities were issued by national and provincial government entities as well as instr unconditionally guaranteed by such entities. As of December 31, 2017, approximately 92% of our foreign government holdings were by at least one of the major rating agencies. Approximately 81% of foreign government holdings were issued or guaranteed by the Germany, Australia or Canada.

The amortized cost and estimated fair value of fixed maturity securities at December 31, 2017 are summarized below by co dates. Actual maturities may differ from contractual maturities due to early call or prepayment rights held by issuers. Amounts a

	Due in one year or less	Due after one year through five years	Due after five years through ten years	Due after ten years	Mortgage-backed securities	Total
Amortized cost	$6,123	$ 11,020	$ 510	$ 2,020	$ 772	$ 20,445
Fair value	6,175	11,183	557	2,576	862	21,353

(4) Investments in equity securities

Investments in equity securities as of December 31, 2017 and 2016 are summarized based on the primary industry of the in below (in millions).

	Cost Basis	Unrealized Gains	Unrealized Losses	Fair Value
*December 31, 2017 **				
Banks, insurance and finance	$ 27,318	$ 53,491	$ —	$ 80,809
Consumer products	24,855	26,088	(68)	50,875
Commercial, industrial and other	24,029	14,969	(142)	38,856
	$ 76,202	$ 94,548	$ (210)	$ 170,540

* *Approximately 65% of the aggregate fair value was concentrated in five companies (American Express Company – $15.1 billio $28.2 billion; Bank of America Corporation – $20.7 billion; The Coca-Cola Company – $18.4 billion and Wells Fargo & Compan*

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(4) Investments in equity securities *(Continued)*

	Cost Basis	Unrealized Gains	Unrealized Losses	Fair Value
*December 31, 2016 **				
Banks, insurance and finance	$ 19,852	$ 30,572	$ —	$ 50,424
Consumer products	10,657	16,760	(9)	27,408
Commercial, industrial and other	35,868	9,033	(701)	44,200
Other investments	7,720	9,536	—	17,256
	$ 74,097	$ 65,901	$ (710)	$ 139,288

* *Approximately 60% of the aggregate fair value was concentrated in five companies (American Express Company – $11.2 billion; Corporation – $14.5 billion; The Coca-Cola Company – $16.6 billion; International Business Machines Corporation – $13.5 b Fargo & Company – $27.6 billion).*

As of December 31, 2016, other investments included preferred stock and common stock warrants of Bank of America Co and preferred stock of Restaurant Brands International, Inc. ("RBI"). In 2011, we acquired 50,000 shares of 6% Non-Cumulative P Stock of Bank of America Corporation ("BAC") with a liquidation value of $100,000 per share ("BAC Preferred") and warrants t 700,000,000 shares of common stock of BAC ("BAC Warrants") at $7.142857 per share (up to $5 billion in the aggregate). On Au exercised all of our BAC Warrants and acquired 700,000,000 shares of BAC common stock. We also surrendered substantially all of as payment of the $5 billion cost to exercise the BAC Warrants and acquire the BAC common stock. Our investment in BAC is incl insurance and finance category at December 31, 2017 and in other investments at December 31, 2016.

On December 12, 2014, we acquired Class A 9% Cumulative Compounding Perpetual Preferred Shares of Restaurant Brand ("RBI") having a stated value of $3 billion ("RBI Preferred"). RBI is domiciled in Canada. On December 12, 2017, RBI redeemed Preferred investment. Prior to its redemption, we were entitled to dividends on the RBI Preferred at 9% per annum plus an additi necessary, to produce an after-tax yield as if the dividends were paid by a U.S.-based company.

As of December 31, 2017 and 2016, unrealized losses on equity securities in a continuous unrealized loss position for m consecutive months were $94 million and $551 million, respectively.

Investments in equity securities are reflected in our Consolidated Balance Sheets as follows (in millions)

	December 31, 2017	December 31, 2016
Insurance and other	$ 164,026	$ 134,835
Railroad, utilities and energy *	1,961	1,186
Finance and financial products *	4,553	3,267
	$ 170,540	$ 139,288

* *Included in other assets.*

(5) Investments in The Kraft Heinz Company

In June 2013, Berkshire invested $12.25 billion in a newly-formed company, H.J. Heinz Holding Corporation ("Heinz investment consisted of 425,000,000 shares of common stock, warrants to acquire approximately 46,000,000 additional shares of $0.01 per share and cumulative compounding preferred stock ("Preferred Stock") with a liquidation preference of $8 billion. An aff investment firm 3G Capital (such affiliate, "3G") also acquired 425,000,000 shares of Heinz Holding common stock for $4.25 bill Berkshire and 3G each owned a 50% share of Heinz Holding common stock. Heinz Holding then acquired H.J. Heinz Co

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(5) Investments in The Kraft Heinz Company *(Continued)*

In June 2015, Berkshire exercised the aforementioned common stock warrants. On July 1, 2015, Berkshire and 3G acquir Heinz Holding common stock for $5.26 billion and $4.74 billion, respectively. After these transactions, Berkshire owned approxima outstanding shares of Heinz Holding. On July 2, 2015, Heinz Holding acquired all of the outstanding common stock of Kraft Foo (“Kraft”), at which time Heinz Holding was renamed The Kraft Heinz Company (“Kraft Heinz”). In connection with its acquisitio Heinz issued one new share of Kraft Heinz common stock for each share of Kraft common stock, which reduced Berkshire’s and interests in Kraft Heinz to 26.8% and 24.2%, respectively. We accounted for our investment in Heinz Holding common stock and co for our investment in Kraft Heinz common stock on the equity method. In applying the equity method, the investor treats an inves shares as if the investor had sold a proportionate share of its investment. As a result, we recorded a non-cash pre-tax holding gain o $6.8 billion in 2015, representing the excess of the fair value of Kraft Heinz common stock at the date of the merger over the carryin with the reduction in our ownership.

Berkshire currently owns 26.7% of the outstanding shares of Kraft Heinz common stock. The carrying value of this in approximately $17.6 billion at December 31, 2017 and $15.3 billion at December 31, 2016. Our earnings determined under the equ 2017 were $2.9 billion, which includes certain one-time effects of the Tax Cuts and Jobs Act of 2017 on Kraft Heinz’s net earning dividends on the common stock of $797 million during 2017 and $952 million in 2016, which we recorded as reductions of our inv 2016, we also received dividends of $180 million on our Preferred Stock investment, which Kraft Heinz redeemed for cash of $8.32 2016.

Kraft Heinz is one of the world’s largest manufacturers and marketers of food and beverage products, including condiments and dairy, meals, meats, refreshment beverages, coffee and other grocery products. Summarized consolidated financial informatio follows (in millions).

	December 30, 2017	December 31, 2016
Assets	$120,232	$120,480
Liabilities	53,985	62,906

	Year ending December 30, 2017	Year ending December 31, 2016	Year ending January 3, 2016
Sales	$ 26,232	$ 26,487	$18,338
Net earnings attributable to Kraft Heinz	$ 10,999	$ 3,632	$634
Net earnings (loss) attributable to common shareholders	$ 10,999	$ 3,452	$(266)

(6) Investment gains/losses

Investment gains/losses for each of the three years ending December 31, 2017 are summarized below (in milli

	2017	2016	2015
Fixed maturity securities—			
Gross gains	$ 103	$ 58	$ 104
Gross losses	(22)	(51)	(171)
Equity securities—			
Gross gains	2,237	7,853	9,526
Gross losses	(919)	(415)	(129)
Other	11	108	43
	$ 1,410	$ 7,553	$ 9,373

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(6) Investment gains/ losses *(Continued)*

We record investments in equity and fixed maturity securities classified as available-for-sale at fair value and record the diff value and cost in other comprehensive income. We recognize investment gains and losses when we sell or otherwise dispose of such gains from equity securities of approximately $1.0 billion in 2017 related to the surrender of substantially all of our BAC Preferred a 4. Gross gains from equity securities in 2016 included approximately $4.2 billion from the redemptions of our investments in Wm. W and Kraft Heinz preferred stock and from the sale of Dow Chemical Company common stock received in the conversion of our Dow stock investment. In 2016, we also recorded a non-cash holding gain of approximately $1.1 billion from the exchange of P&G co connection with the acquisition of Duracell. See Note 2. Gross gains from equity securities in 2015 included a non-cash holding gain $6.8 billion in connection with our investment in Kraft Heinz common stock. See Note 5.

(7) Inventories

Inventories are comprised of the following (in millions).

	December 31, 2017	December 31, 2016
Raw materials	$ 2,997	$ 2,789
Work in process and other	2,315	2,506
Finished manufactured goods	4,179	4,033
Goods acquired for resale	6,696	6,399
	$ 16,187	$ 15,727

(8) Receivables

Receivables of insurance and other businesses are comprised of the following (in millions).

	December 31, 2017	December 31, 2016
Insurance premiums receivable	$ 11,058	$ 10,462
Reinsurance recoverable on unpaid losses	3,201	3,338
Trade and other receivables	14,681	13,630
Allowances for uncollectible accounts	(362)	(333)
	$ 28,578	$ 27,097

Loans and finance receivables of finance and financial products businesses are summarized as follows (in mill

	December 31, 2017	December 31, 2016
Loans and finance receivables before allowances and discounts	$ 14,126	$ 13,728
Allowances for uncollectible loans	(180)	(182)
Unamortized acquisition discounts	(198)	(246)
	$ 13,748	$ 13,300

Loans and finance receivables are predominantly installment loans originated or acquired by our manufactured housing bu for loan losses for 2017 and 2016 were $160 million and $144 million, respectively. Loan charge-offs, net of recoveries, were $162 r $144 million in 2016. At December 31, 2017, approximately 98% of the loan balances were evaluated collectively for impairmen evaluation process, credit quality indicators are reviewed and loans are designated as performing or non-performing. At Decembe considered approximately 99% of the loan balances to be performing and approximately 95% of the loan balances to be current as to June 2017, we agreed to provide a Canada-based financial institution with a C$2 billion (approximately $1.6 billion) one-year secure facility. The agreement expires on June 29, 2018. There was no outstanding loan balance as of December 31, 2017

(9) Property, plant and equipment and assets held for lease

A summary of property, plant and equipment of our insurance and other businesses follows (in millions).

	December 31, 2017	December 31, 2016
Land	$ 2,292	$ 2,108
Buildings and improvements	8,810	8,360
Machinery and equipment	21,935	20,463
Furniture, fixtures and other	4,387	4,080
	37,424	35,011
Accumulated depreciation	(17,320)	(15,686)
	$ 20,104	$ 19,325

A summary of property, plant and equipment of our railroad and our utilities and energy businesses follows (in millions). Th transmission and distribution systems and interstate natural gas pipeline assets are owned by regulated public utility and natura subsidiaries.

	December 31, 2017	December 31, 2016
Railroad:		
Land	$ 6,088	$ 6,063
Track structure and other roadway	51,320	48,277
Locomotives, freight cars and other equipment	12,543	12,075
Construction in progress	989	965
	70,940	67,380
Accumulated depreciation	(8,627)	(6,130)
	62,313	61,250
Utilities and energy:		
Utility generation, transmission and distribution systems	74,660	71,536
Interstate natural gas pipeline assets	7,176	6,942
Independent power plants and other assets	7,499	6,596
Construction in progress	2,556	2,098
	91,891	87,172
Accumulated depreciation	(26,020)	(24,663)
	65,871	62,509
	$ 128,184	$ 123,759

Assets held for lease and property, plant and equipment of our finance and financial products businesses are summarized b Assets held for lease includes railcars, intermodal tank containers, cranes, over-the-road trailers, storage units and furniture. As of D the minimum future lease rentals to be received on assets held for lease (including rail cars leased from others) were as follows (in $1,103; 2019 – $857; 2020 – $641; 2021 – $439; 2022 – $283; and thereafter – $407.

	December 31, 2017	December 31, 2016
Assets held for lease	$ 12,318	$ 11,902
Land	231	224
Buildings, machinery and other	1,444	1,302
	13,993	13,428
Accumulated depreciation	(4,062)	(3,739)
	$ 9,931	$ 9,689

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(9) Property, plant and equipment and assets held for lease *(Continued)*

Depreciation expense for each of the three years ending December 31, 2017 is summarized below (in millio

	2017	2016	2015
Insurance and other	$ 2,217	$ 2,148	$ 1,680
Railroad, utilities and energy	4,852	4,639	4,383
Finance and financial products	650	624	610
	$ 7,719	$ 7,411	$ 6,673

(10) Goodwill and other intangible assets

Reconciliations of the changes in the carrying value of goodwill during 2017 and 2016 follows (in millions

	December 31, 2017	December 31, 2016
Balance at beginning of year	$ 79,486	$ 62,708
Acquisitions of businesses	1,545	17,650
Other, including foreign currency translation	227	(872)
Balance at end of year	$ 81,258	$ 79,486

Our other intangible assets and related accumulated amortization are summarized as follows (in millions)

	December 31, 2017		December 31, 2016	
	Gross carrying amount	Accumulated amortization	Gross carrying amount	Accumulated amortization
Insurance and other	$ 40,225	$ 7,707	$ 39,976	$ 6,495
Railroad, utilities and energy	988	324	898	293
	$ 41,213	$ 8,031	$ 40,874	$ 6,788
Trademarks and trade names	$ 5,381	$ 692	$ 5,175	$ 616
Patents and technology	4,341	2,493	4,341	2,328
Customer relationships	28,322	3,722	28,243	2,879
Other	3,169	1,124	3,115	965
	$ 41,213	$ 8,031	$ 40,874	$ 6,788

Intangible asset amortization expense was $1,469 million in 2017, $1,490 million in 2016 and $1,106 million in 2015. Esti expense over the next five years is as follows (in millions): 2018 – $1,400; 2019 – $1,270; 2020 – $1,175; 2021 – $1,086 and 2022 – assets with indefinite lives as of December 31, 2017 and 2016 were $18,930 million and $18,705 million, respectively, and primaril customer relationships and trademarks and trade names.

(11) Derivative contracts

We are party to derivative contracts primarily through our finance and financial products and our utilities and energy busine derivative contracts of our finance and financial products businesses consist of equity index put option contracts written between 20 liabilities and related notional values of such contracts follows (in millions).

	December 31, 2017		December 31, 2016	
	Liabilities	Notional Value	Liabilities	Notional Value
Equity index put options	$ 2,172	$ 28,753 *(1)*	$ 2,890	$ 26,497 *(1)*

(1) *Represents the aggregate undiscounted amounts payable assuming that the value of each index is zero at each contract's expirati these contracts are denominated in foreign currencies. Notional amounts are based on the foreign currency exchange rates as of date.*

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(11) Derivative contracts *(Continued)*

We record derivative contract liabilities at fair value and include the changes in the fair values of such contracts in earnings losses. A summary of the derivative gains/losses included in our Consolidated Statements of Earnings in each of the three years end 2017 follows (in millions).

	2017	2016	2015
Equity index put options	$ 718	$ 662	$ 1,008
Other	—	89	(34)
	$ 718	$ 751	$ 974

The equity index put option contracts are European style options written prior to March 2008 on four major equity indexe expire between June 2018 and January 2026. Future payments, if any, under any given contract will be required if the prevailing inc the contract strike price at the expiration date. We received aggregate premiums of $4.2 billion on these contracts at the contract ince have no counterparty credit risk. The aggregate intrinsic value (the undiscounted liability assuming the contracts are settled based o and foreign currency exchange rates as of the balance sheet date) was $789 million at December 31, 2017 and $1.0 billion at Decemb contracts may not be unilaterally terminated or fully settled before the expiration dates and the ultimate amount of cash basis gains contracts will not be determined until the contract expiration dates. The remaining weighted average life of all contracts was approxi December 31, 2017.

A limited number of our equity index put option contracts contain collateral posting requirements with respect to changes i intrinsic value of the contracts and/or a downgrade of Berkshire's credit ratings. As of December 31, 2017, we did not have any c requirements. If Berkshire's credit ratings (currently AA from Standard & Poor's and Aa2 from Moody's) are downgraded belo Standard & Poor's or A3 by Moody's, collateral of up to $1.1 billion could be required to be posted.

Our regulated utility subsidiaries are exposed to variations in the prices of fuel required to generate electricity, wholesale el and sold and natural gas supplied for customers. Derivative instruments, including forward purchases and sales, futures, swaps and c manage a portion of these price risks. Derivative contract assets are included in other assets and were $142 million as of December 3 Derivative contract liabilities are included in accounts payable, accruals and other liabilities and were $82 million as of Decembe $145 million as of December 31, 2016. Most of the net derivative contract assets or liabilities of our regulated utilities are probable c rates and are offset by regulatory liabilities or assets. Unrealized gains or losses on contracts accounted for as cash flow or fair value in other comprehensive income or in net earnings, as appropriate.

(12) Supplemental cash flow information

A summary of supplemental cash flow information for each of the three years ending December 31, 2017 is presented in the millions).

	2017	2016	2015
Cash paid during the period for:			
Income taxes	$ 3,286	$ 4,719	$ 4,535
Interest:			
Insurance and other businesses	871	555	346
Railroad, utilities and energy businesses	2,828	2,788	2,717
Finance and financial products businesses	389	389	403
Non-cash investing and financing activities:			
Liabilities assumed in connection with business acquisitions	747	16,555	2,812
Equity securities exchanged in connection with business acquisitions	—	4,239	—
Conversions and other exchanges of investments	—	4,154	1,597
Equity securities surrendered in connection with warrant exercise	4,965	—	—

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(13) Unpaid losses and loss adjustment expenses

Our liabilities for unpaid losses and loss adjustment expenses (also referred to as "claim liabilities") under short duration pr insurance and reinsurance contracts are based upon estimates of the ultimate claim costs associated with claim occurrences as of the and include estimates for incurred-but-not-reported ("IBNR") claims. A reconciliation of the changes in claim liabilities, excluding retroactive reinsurance contracts (see Note 14), for each of the three years ending December 31, 2017 is as follows (in mi

	2017	2016	2015
Balances – beginning of year:			
Gross liabilities	$ 53,379	$ 50,519	$ 48,208
Reinsurance recoverable on unpaid losses	(3,338)	(3,307)	(3,116)
Net liabilities	50,041	47,212	45,092
Incurred losses and loss adjustment expenses:			
Current accident year events	37,702	30,636	27,829
Prior accident years' events	(544)	(1,523)	(2,015)
Discount accretion	—	80	82
Total incurred losses and loss adjustment expenses	37,158	29,193	25,896
Paid losses and loss adjustment expenses:			
Current accident year events	(17,425)	(14,898)	(13,070)
Prior accident years' events	(12,507)	(10,929)	(10,229)
Total payments	(29,932)	(25,827)	(23,299)
Foreign currency translation adjustment	654	(537)	(545)
Business acquisition	—	—	68
Balances – end of year:			
Net liabilities	57,921	50,041	47,212
Reinsurance recoverable on unpaid losses	3,201	3,338	3,307
Gross liabilities	$ 61,122	$ 53,379	$ 50,519

Incurred losses and loss adjustment expenses in the preceding table were recorded in earnings in each period and related t occurring in the current year ("current accident year") and events occurring in all prior years ("prior accident years"). We incurred cu losses of approximately $3 billion in 2017 with respect to hurricanes Harvey, Irma and Maria, an earthquake in Mexico, a cyclone wildfires in California.

Incurred losses and loss adjustment expenses also included net reductions of estimated ultimate liabilities for prior acc $544 million, $1.5 billion and $2.0 billion in 2017, 2016 and 2015, respectively. Overall, we decreased estimated ultimate liabilitie primary insurance by $249 million in 2017, $569 million in 2016 and $793 million in 2015. In each year, estimated ultimate claim l accident years were generally lower for medical malpractice and workers' compensation insurance. For primary private passenger au claims, we increased liabilities for prior years' claims in 2017, primarily due to increased average claims severities, and decreased l years' claims in 2016 and 2015. We decreased estimated ultimate liabilities with respect to property and casualty reinsurance by $29 $955 million in 2016 and $1.2 billion in 2015. The decrease in 2017 included increased losses from a United Kingdom government-m the computation of certain personal injury lump sum settlements and higher than expected property losses.

Estimated claim liabilities for environmental, asbestos and other latent injury exposures, net of reinsurance recoverables, w $1.6 billion at December 31, 2017 and 2016. These liabilities are subject to change due to changes in the legal and regulatory enviro in Note 14. We are unable to reliably estimate additional losses or a range of losses that are reasonably possible for these

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(13) Unpaid losses and loss adjustment expenses *(Continued)*

A reconciliation of certain net unpaid losses and allocated loss adjustment expenses (the latter referred to as "ALAE") of G Hathaway Reinsurance Group ("BHRG", which includes the NICO Group and General Re Group) and Berkshire Hathaway Prima Primary") to our consolidated unpaid losses and loss adjustment expenses as of December 31, 2017, along with a discussion regard liability estimation processes, follows (in millions).

	GEICO	BHRG Property	BHRG Casualty	BH Primary	Total
Unpaid losses and ALAE, net	$ 15,655	$ 8,838	$ 19,219	$ 11,867	$ 55,579
Reinsurance recoverable	859	289	1,028	1,025	3,201
Unpaid unallocated loss adjustment expenses					2,342
Unpaid losses and loss adjustment expenses					$ 61,122

GEICO

GEICO's claim liabilities predominantly relate to various types of private passenger auto liability and physical damage clai establish and evaluate unpaid claim liabilities using standard actuarial loss development methods and techniques. The actuarial metho claims data, adjusted when deemed appropriate to reflect perceived changes in loss patterns. Claim liabilities include average, case, and IBNR estimates.

We establish average liabilities based on expected severities for newly reported physical damage and liability claims prior individual case reserve when we have insufficient time and information to make specific claim estimates and for a large number o damage claims that are paid shortly after being reported. We establish liability case loss estimates, which includes loss adjustment e facts and merits of the claim are evaluated.

Estimates for liability coverages are more uncertain primarily due to the longer claim-tails, the greater chance of protracted incompleteness of facts at the time the case estimate is first established. The "claim-tail" is the time period between the claim occu settlement date. As a result, we establish additional case development liabilities, which are usually percentages of the case liabilitie claims, IBNR liabilities are estimated by projecting the ultimate number of claims expected (reported and unreported) for each signif deducting reported claims to produce estimated unreported claims. The product of the average cost per unreported claim and the num claims produces the IBNR liability estimate. We may record supplemental IBNR liabilities in certain situations when actuarial techni apply.

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(13) Unpaid losses and loss adjustment expenses *(Continued)*

GEICO's aggregate incurred and paid loss and ALAE data by accident year for these claims, net of reinsurance, follows. development liabilities are as of December 31, 2017. Claim counts are established when accidents that may result in a liability are based on policy coverage. Each claim event may generate claims under multiple coverages, and thus may result in multiple counts. Number of Reported Claims" includes the combined number of reported claims for all policy coverages and excludes projected IBN are in millions.

Accident Year	Incurred Losses and ALAE through December 31, 2013*	2014*	2015*	2016*	2017	IBNR and Case Development Liabilities	Cumulative Number of Reported Claims (in thousands)
2013	$ 13,085	$ 12,900	$ 12,943	$ 12,920	$ 12,961	$ 105	7,105
2014		14,680	14,572	14,559	14,589	236	7,972
2015			16,887	16,875	16,993	682	8,915
2016				19,106	19,390	1,806	9,601
2017					22,675	4,343	10,513
Incurred losses and ALAE					$ 86,608		

Accident Year	Cumulative Paid Losses and ALAE through December 31, 2013*	2014*	2015*	2016*	2017
2013	$ 8,006	$ 10,573	$ 11,650	$ 12,256	$ 12,618
2014		9,199	12,036	13,140	13,850
2015			10,606	13,858	15,285
2016				12,020	15,862
2017					13,878
Paid losses and ALAE					71,493
Net unpaid losses and ALAE for 2013 – 2017 accident years					15,115
Net unpaid losses and ALAE for accident years before 2013					540
Net unpaid losses and ALAE					$ 15,655

* *Unaudited supplemental information*

BHRG

We use a variety of actuarial methodologies to establish BHRG's property and casualty claims liabilities. We use certain m as paid and incurred loss development techniques, incurred and paid loss Bornhuetter-Ferguson techniques and frequency and sever well as ground-up techniques when appropriate.

Our claims liabilities are principally a function of reported losses from ceding companies, case development and IBNR liabi loss estimates are reported under our contracts either individually or in bulk as provided under the terms of the contracts. We may evaluate case losses reported by the ceding company, and if deemed appropriate, we may establish case liabilities based on our esti IBNR liabilities are driven by expected case loss emergence patterns and expected loss ratios, which may be evaluated as groups contracts with similar exposures, or on an individual contract-by-contract basis. Case and IBNR liability estimates for major catastro based on a per-contract assessment of the ultimate cost associated with the individual loss event. Claim count data is not provided, as not provided consistently by ceding companies under our contracts or is otherwise considered unreliable.

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(13) Unpaid losses and loss adjustment expenses *(Continued)*

We disaggregated net losses and ALAE for BHRG based on losses that are expected to have shorter claim-tails (property) ar have longer claim-tails (casualty). Under certain contracts, the coverage can apply to multiple lines of business written by the ceding property, casualty or combined, and the ceding company may not report loss data by such lines consistently, if at all. In those instar losses to property and casualty coverages based on internal estimates. In the following tables, BHRG's incurred and paid loss anc separately presented for property and casualty coverage by accident year, net of reinsurance. IBNR and case development liabil December 31, 2017. Dollars are in millions.

BHRG Property

Accident Year	Incurred Losses and ALAE through December 31,										IBNR and Case Development Liabilities
	2008*	2009*	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017	
2008	$ 3,030	$ 2,720	$ 2,773	$ 2,483	$ 2,392	$ 2,432	$ 2,386	$ 2,353	$2,344	$2,336	$ 6
2009		2,385	2,057	2,250	2,171	2,075	2,048	2,006	2,001	2,000	8
2010			2,545	2,538	2,424	2,289	2,200	2,164	2,146	2,126	32
2011				4,192	4,127	3,850	3,764	3,761	3,729	3,706	84
2012					3,153	2,851	2,645	2,404	2,351	2,347	95
2013						3,230	3,074	2,727	2,636	2,614	172
2014							2,646	2,458	2,344	2,199	223
2015								3,268	3,115	2,557	232
2016									3,294	3,938	1,072
2017										5,276	1,993
	Incurred losses and ALAE									$ 29,099	

Accident Year	Cumulative Paid Losses and ALAE through December 31,									
	2008*	2009*	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017
2008	$ 481	$ 1,449	$ 1,825	$ 2,055	$ 2,159	$ 2,205	$ 2,240	$ 2,296	$ 2,307	$ 2,308
2009		405	1,122	1,627	1,792	1,861	1,931	1,965	1,975	1,977
2010			339	1,081	1,520	1,789	1,950	2,007	2,054	2,079
2011				661	2,308	2,963	3,233	3,344	3,433	3,475
2012					265	1,232	1,813	1,952	2,041	2,116
2013						522	1,447	1,892	2,090	2,211
2014							467	1,259	1,591	1,731
2015								571	1,604	1,959
2016									706	1,807
2017										1,028
	Paid losses and ALAE									20,691
	Net unpaid losses and ALAE for 2008 – 2017 accident years									8,408
	Net unpaid losses and ALAE for accident years before 2008									430
	Net unpaid losses and ALAE									$ 8,838

** Unaudited supplemental information*

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(13) Unpaid losses and loss adjustment expenses *(Continued)*

BHRG Casualty

Accident Year	Incurred Losses and ALAE through December 31, 2008*	2009*	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017	IBNR and Case Development Liabilities
2008	$ 2,448	$ 2,602	$ 2,279	$ 2,358	$ 2,309	$ 2,161	$ 2,101	$ 2,042	$ 2,009	$ 2,010	$ 226
2009		2,393	2,711	2,571	2,500	2,437	2,362	2,315	2,252	2,213	225
2010			2,320	2,413	2,345	2,282	2,162	2,111	2,066	1,903	166
2011				2,628	2,720	2,589	2,529	2,440	2,348	2,340	419
2012					2,811	2,995	2,829	2,892	2,819	2,705	663
2013						2,152	2,290	2,320	2,162	2,107	644
2014							1,891	2,090	2,059	2,021	736
2015								1,895	2,102	2,130	803
2016									1,923	2,132	1,012
2017										2,209	1,428
Incurred losses and ALAE										$ 21,770	

Accident Year	Cumulative Paid Losses and ALAE through December 31, 2008*	2009*	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017
2008	$ 253	$664	$959	$ 1,067	$ 1,168	$ 1,250	$ 1,325	$ 1,367	$ 1,405	$ 1,442
2009		249	858	947	1,219	1,439	1,596	1,632	1,669	1,695
2010			120	553	846	1,035	1,288	1,384	1,448	1,493
2011				293	822	1,167	1,409	1,498	1,591	1,670
2012					311	754	1,147	1,378	1,535	1,660
2013						293	527	814	943	1,048
2014							152	485	651	761
2015								198	497	722
2016									254	561
2017										232
Paid losses and ALAE										11,284
Net unpaid losses and ALAE for 2008 – 2017 accident years										10,486
Net unpaid losses and ALAE for accident years before 2008										8,733
Net unpaid losses and ALAE										$ 19,219

* *Unaudited supplemental information*

BH Primary

BH Primary's liabilities for unpaid losses and ALAE primarily derive from workers' compensation, medical professional a insurance. Other liability insurance includes commercial auto and general liability policies. We periodically evaluate ultimate unpai estimates for the workers' compensation and general liability lines using a combination of commonly accepted actuarial methodolo Bornhuetter–Ferguson and chain-ladder approaches using paid and incurred loss data. Paid and incurred loss data is segregated int coverages, territories or other characteristics. We establish case liabilities for reported claims based upon the facts and circumstance excess of the ultimate projected losses, including the expected development of case estimates, and the case-basis liabilities is inc liabilities. For medical professional liabilities, we use a combination of the aforementioned methods, as well as other loss severity ba these estimates, we determine our best estimate. Periodically, we study developments in older accident years and adjust initial loss e recent development based upon claim age, coverage and litigation experience. The cumulative number of reported claims reflects individual claimants, and includes claims that ultimately result in no liability or payment.

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Notes to Consolidated Financial Statements *(Continued)*

(13) Unpaid losses and loss adjustment expenses *(Continued)*

BH Primary's incurred and paid loss and ALAE data by accident year, net of reinsurance, is presented in the following tabl development liabilities are as of December 31, 2017. Dollars are in millions.

	Incurred Losses and ALAE through December 31,											
Accident Year	2008*	2009*	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017	IBNR and Case Development Liabilities	Cumula Number Report Claim (in thous
2008	$ 1,573	$ 1,503	$ 1,448	$ 1,369	$ 1,250	$ 1,182	$ 1,135	$ 1,103	$ 1,073	$ 1,063	$ 69	
2009		1,528	1,435	1,392	1,322	1,229	1,164	1,109	1,073	1,047	75	
2010			1,516	1,437	1,378	1,321	1,234	1,163	1,119	1,068	107	
2011				1,563	1,461	1,446	1,359	1,290	1,249	1,189	168	
2012					1,710	1,675	1,631	1,559	1,518	1,423	250	
2013						2,199	2,127	2,052	1,977	1,900	424	
2014							2,906	2,737	2,687	2,580	736	
2015								3,519	3,406	3,266	1,095	
2016									4,149	4,024	1,917	
2017										5,024	3,161	
Incurred losses and ALAE										$ 22,584		

	Cumulative Paid Losses and ALAE through December 31,									
Accident Year	2008*	2009*	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017
2008	$181	$369	$535	$676	$771	$852	$903	$932	$ 950	$ 968
2009		136	335	507	643	752	838	891	921	933
2010			153	366	522	661	768	846	889	916
2011				167	331	533	682	824	903	946
2012					165	444	642	820	956	1,049
2013						279	621	903	1,118	1,272
2014							387	833	1,192	1,504
2015								499	1,060	1,498
2016									634	1,302
2017										761
Paid losses and ALAE										11,149
Net unpaid losses and ALAE for 2008 – 2017 accident years										11,435
Net unpaid losses and ALAE for accident years before 2008										432
Net unpaid losses and ALAE										$ 11,867

* *Unaudited supplemental information*

Supplemental unaudited average historical claims duration information based on the net losses and ALAE incurred and paid a the preceding tables follows. The percentages show the average portions of net losses and ALAE paid by each succeeding year, with the current accident year.

Average Annual Percentage Payout of Incurred Losses by Age, Net of Reinsurance

In Years	1	2	3	4	5	6	7	8	9	10
GEICO	61.9%	19.6%	8.1%	4.9%	2.8%					
BHRG Property	18.7%	37.5%	18.8%	8.3%	4.5%	2.7%	1.6%	1.4%	0.3%	0.0%
BHRG Casualty	10.7%	18.4%	12.0%	8.3%	7.1%	5.0%	3.0%	2.0%	1.5%	1.8%

BH Primary	14.6%	17.7%	15.0%	12.5%	9.8%	7.3%	4.4%	2.7%	1.4%	1.7%

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(14) Retroactive reinsurance contracts

Retroactive reinsurance policies provide indemnification of losses and loss adjustment expenses of short-duration insuran respect to underlying loss events that occurred prior to the contract inception date. Claims payments may commence immediately aft or, if applicable, once a contractual retention amount has been reached. Reconciliations of the changes in estimated liabilities for retr unpaid losses and loss adjustment expenses ("claim liabilities") and related deferred charge reinsurance assumed assets for each of th December 31, 2017 follows (in millions).

	2017		2016		
	Unpaid losses and loss adjustment expenses	Deferred charges reinsurance assumed	Unpaid losses and loss adjustment expenses	Deferred charges reinsurance assumed	Unpaid and l adjust exper
Balances – beginning of year	$ 24,972	$ (8,047)	$ 24,058	$ (7,687)	$ 24
Incurred losses and loss adjustment expenses					
Current year contracts	19,005	(7,730)	2,136	(874)	
Prior years' contracts	(41)	499	(63)	514	
Total	18,964	(7,231)	2,073	(360)	
Paid losses and loss adjustment expenses	(999)	—	(1,159)	—	(1
Balances – end of year	$ 42,937	$ (15,278)	$ 24,972	$ (8,047)	$ 24
Incurred losses and loss adjustment expenses, net of deferred charges	$ 11,733		$ 1,713		$

In the preceding table, classifications of incurred losses and loss adjustment expenses are based on the inception dates of th not believe that analysis of losses incurred and paid by accident year of the underlying event is relevant or meaningful given that our incepts when the contract incepts. Further, we believe the classifications of reported claims and case development liabilities has litt analytical value.

In 2017, we entered into an agreement through a Berkshire subsidiary, National Indemnity Company ("NICO"), with vario American International Group, Inc. (collectively, "AIG"), which became effective on February 2, 2017. Under this agreement, N indemnify AIG for 80% of up to $25 billion of losses and allocated loss adjustment expenses in excess of $25 billion retained by AI certain commercial insurance loss events occurring prior to 2016. As of the effective date, we recorded premiums earned of $10.2 b recorded a liability for unpaid losses and loss adjustment expenses of $16.4 billion and a deferred charge reinsurance assumed asse Berkshire agreed to guarantee the timely payment of all amounts due to AIG under the agreement.

In the fourth quarter of 2017, we increased our estimated ultimate claim liabilities under the aforementioned AIG contract $1.8 billion based on higher than expected loss payments reported by AIG under the contractual retention. We also increased the rela asset by $1.7 billion based on our re-estimation of the amounts and timing of future claim payments. As of yearend 2017, our net l contract was approximately $10.7 billion, representing the excess of the estimated ultimate claim liabilities of approximately $18.2 remaining deferred charge asset balance of approximately $7.5 billion.

Incurred losses and loss adjustment expenses related to contracts written in prior years were $458 million in 2017, $451 m $631 million in 2015, which included recurring amortization of deferred charges and the effect of changes in the timing and amount loss payments.

In establishing retroactive reinsurance claim liabilities, we analyze historical aggregate loss payment patterns and project lo under various probability-weighted scenarios. We expect the claim-tail to be very long for many contracts, with some lasting seve monitor claim payment activity and review ceding company reports and other information concerning the underlying losses. We reas expected timing and amounts of ultimate losses periodically or when significant events are revealed through our monitoring and re

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(14) Retroactive reinsurance contracts *(Continued)*

Our retroactive reinsurance claim liabilities include estimated liabilities for environmental, asbestos and other latent inju approximately $14.0 billion at December 31, 2017 and $13.7 billion at December 31, 2016. Retroactive reinsurance contracts are g aggregate policy limits and thus, our exposure to such claims under these contracts is likewise limited. We monitor evolving case la environmental and other latent injury claims. Changing government regulations, newly identified toxins, newly reported claims, new new contract interpretations and other factors could result in increases in these liabilities, which could be material to our results of unable to reliably estimate the amount of additional net loss or the range of net loss that is reasonably possible.

(15) Notes payable and other borrowings

Notes payable and other borrowings are summarized below (in millions). The weighted average interest rates and maturity in the following tables are based on borrowings as of December 31, 2017.

	Weighted Average Interest Rate	December 31, 2017	December 31, 2016
Insurance and other:			
Issued by Berkshire:			
U.S. Dollar denominated borrowings due 2018-2047	2.8%	$ 10,603	$ 11,709
Euro denominated borrowings due 2020-2035	1.1%	8,164	5,994
Short-term subsidiary borrowings	3.4%	1,832	2,094
Other subsidiary borrowings due 2018-2045	3.6%	6,725	7,378
		$ 27,324	$ 27,175

In January 2017, Berkshire issued €1.1 billion in senior unsecured notes. The notes consisted of €550 million of 0.25% not €550 million of 0.625% notes due in 2023. In January 2017, senior notes of $1.1 billion matured. In 2017, the carrying value of E denominated senior notes increased $990 million due to changes in the Euro/U.S. Dollar exchange rates. This increase produced a co to pre-tax earnings of $990 million which was recorded as additional non-cash interest expense.

	Weighted Average Interest Rate	December 31, 2017	December 31, 2016
Railroad, utilities and energy:			
Issued by Berkshire Hathaway Energy Company ("BHE") and its subsidiaries:			
BHE senior unsecured debt due 2018-2045	5.1%	$ 6,452	$ 7,818
Subsidiary and other debt due 2018-2064	4.8%	28,739	27,354
Short-term debt	2.0%	4,488	1,869
Issued by BNSF due 2018-2097	4.8%	22,499	22,044
		$ 62,178	$ 59,085

BHE subsidiary debt represents amounts issued pursuant to separate financing agreements. Substantially all of the assets subsidiaries are, or may be, pledged or encumbered to support or otherwise secure debt. These borrowing arrangements generally covenants including, but not limited to, leverage ratios, interest coverage ratios and debt service coverage ratios, among other coven BHE and its subsidiaries issued approximately $1.9 billion of term debt with maturity dates ranging from 2022 to 2057 with a weigh rate of 3.2%.

BHE's short-term debt outstanding increased, in part to fund the prepayment of approximately $1.0 billion of BHE senior connection with a tender offer in December 2017. BHE recognized a pre-tax loss of $410 million, which was included in interes Consolidated Statement of Earnings. In January 2018, BHE issued $2.2 billion of senior notes with maturity dates ranging from 20 weighted average interest rate of 3.2%. Proceeds from this debt issuance were used to repay short-term debt and for general corp

BNSF's borrowings are primarily senior unsecured debentures. In March 2017, BNSF issued $1.25 billion of senior unse consisting of $500 million of 3.25% debentures due in 2027 and $750 million of 4.125% debentures due in 2047. As of December BHE and their subsidiaries were in compliance with all applicable debt covenants. Berkshire does not guarantee any debt, borrowin of BNSF, BHE or their subsidiaries.

(15) Notes payable and other borrowings *(Continued)*

	Weighted Average Interest Rate	December 31, 2017	December 31, 2016
Finance and financial products:			
Issued by Berkshire Hathaway Finance Corporation ("BHFC") due 2018-2043	2.8%	$ 12,926	$ 14,423
Issued by other subsidiaries due 2018-2036	4.5%	159	961
		$ 13,085	$ 15,384

In January 2017, BHFC issued $1.3 billion of senior notes consisting of $950 million of floating rate notes due in 2019 an floating rate notes due in 2020. During 2017, senior notes of $2.8 billion matured. The borrowings of BHFC, a wholly owned fina Berkshire, are fully and unconditionally guaranteed by Berkshire.

As of December 31, 2017, our subsidiaries had unused lines of credit and commercial paper capacity aggregating approxim support short-term borrowing programs and provide additional liquidity. Such unused lines of credit included about $4.0 billion rela subsidiaries. In addition to BHFC's borrowings, at December 31, 2017, Berkshire guaranteed approximately $1.9 billion of other sub Generally, Berkshire's guarantee of a subsidiary's debt obligation is an absolute, unconditional and irrevocable guarantee for the payment when due of all payment obligations.

Principal repayments expected during each of the next five years are as follows (in millions).

	2018	2019	2020	2021	2022
Insurance and other	$ 4,741	$ 844	$ 1,800	$ 2,527	$ 850
Railroad, utilities and energy	8,659	2,939	2,245	1,804	3,395
Finance and financial products	4,661	4,016	931	750	775
	$ 18,061	$ 7,799	$ 4,976	$ 5,081	$ 5,020

(16) Income taxes

The liabilities for income taxes reflected in our Consolidated Balance Sheets are as follows (in millions).

	December 31, 2017	December 31, 2016
Currently payable (receivable)	$ (129)	$ 500
Deferred	56,182	76,457
Other	554	485
	$ 56,607	$ 77,442

On December 22, 2017, President Trump signed into law the Tax Cuts and Jobs Act of 2017 ("TCJA"). Among its provi reduces the statutory U.S. Corporate income tax rate from 35% to 21% effective January 1, 2018. The TCJA also provides for a one- accumulated undistributed post-1986 earnings of foreign subsidiaries. Further, the TCJA includes provisions that, in certain instan income tax liabilities on future earnings of foreign subsidiaries and limit the deductibility of future interest expenses. The TCJA a accelerated deductions of certain capital expenditures made after September 27, 2017 through bonus depreciation. The application change due to regulations subsequently issued by the U.S. Treasury Department.

Upon the enactment of the TCJA, we recorded a reduction in our deferred income tax liabilities of approximately $35.6 bill the aforementioned change in the U.S. statutory income tax rate. As a result, we recorded an income tax benefit of approximately $2 increased regulatory liabilities of our regulated utility subsidiaries by approximately $6.0 billion for the portion of the deferred inc reduction that we will be required to, effectively, refund to customers in the rate setting process. We also recognized an income approximately $1.4 billion with respect to the deemed repatriation of the accumulated undistributed post-1986 earnings of our fore Thus, upon the enactment of the TCJA, we included a net income tax benefit in our 2017 earnings of approximately $28.2

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(16) Income taxes *(Continued)*

In December 2017, the Securities and Exchange Commission issued Staff Accounting Bulletin 118 ("SAB 118") to provic implementing the TCJA when registrants do not have the necessary information available to complete the accounting for an element period of its enactment. SAB 118 provides for tax amounts to be classified as provisional and subject to remeasurement for up to c enactment date for such elements when the accounting effect is not complete, but can be reasonably estimated.

We consider our estimate of the tax on accumulated undistributed earnings of foreign subsidiaries to be provisional a remeasurement when we obtain the necessary additional information to complete the accounting. While we believe our estimate to b take additional time to validate the inputs to the foreign earnings and profits calculations, the basis on which the repatriation tax is de the applicable states will address the U.S. repatriation tax. We currently expect that our accounting for the repatriation tax under tl completed by the end of 2018.

We have not established deferred income taxes on accumulated undistributed earnings of certain foreign subsidiaries, which reinvested indefinitely. Repatriation of all accumulated earnings of foreign subsidiaries would be impracticable to the extent that such capital to support normal business operations. Although no U.S. federal taxes will be imposed on future distributions of foreign ea jurisdictions the distributions could be subject to withholding and other local taxes.

The tax effects of temporary differences that give rise to significant portions of deferred tax assets and deferred tax liabilitie (in millions).

	December 31, 2017	December 31, 2016
Deferred tax liabilities:		
Investments – unrealized appreciation and cost basis differences	$ 24,251	$ 27,669
Deferred charges reinsurance assumed	3,226	2,876
Property, plant and equipment	26,671	39,345
Goodwill and other intangible assets	7,204	11,344
Other	3,216	5,550
	64,568	86,784
Deferred tax assets:		
Unpaid losses and loss adjustment expenses	(1,231)	(1,363)
Unearned premiums	(345)	(1,021)
Accrued liabilities	(2,501)	(3,821)
Other	(4,309)	(4,122)
	(8,386)	(10,327)
Net deferred tax liability	$ 56,182	$ 76,457

Income tax expense reflected in our Consolidated Statements of Earnings for each of the three years ending December 31, (in millions).

	2017	2016	2015
Federal	$ (23,427)	$ 7,796	$ 9,253
State	894	556	578
Foreign	1,018	888	701
	$ (21,515)	$ 9,240	$ 10,532
Current	$ 3,299	$ 6,565	$ 5,426
Deferred	(24,814)	2,675	5,106
	$ (21,515)	$ 9,240	$ 10,532

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(16) Income taxes *(Continued)*

Income tax expense is reconciled to hypothetical amounts computed at the U.S. federal statutory rate for each of the thr December 31, 2017 in the table below (in millions).

	2017	2016	2015
Earnings before income taxes	$ 23,838	$ 33,667	$ 34,946
Hypothetical income tax expense computed at the U.S. federal statutory rate	$ 8,343	$ 11,783	$ 12,231
Dividends received deduction and tax exempt interest	(905)	(789)	(1,146)
State income taxes, less U.S. federal income tax benefit	465	361	374
Foreign tax rate differences	(339)	(421)	(459)
U.S. income tax credits	(636)	(518)	(461)
Non-taxable exchange of investments	—	(1,143)	—
Net benefit from the enactment of the TCJA	(28,200)	—	—
Other differences, net	(243)	(33)	(7)
	$ (21,515)	$ 9,240	$ 10,532

We file income tax returns in the United States and in state, local and foreign jurisdictions. We are under examination by th in many of these jurisdictions. We have settled income tax liabilities with U.S. federal taxing authorities (the “IRS”) for years befo continues to audit Berkshire’s consolidated U.S. federal income tax returns for the 2010 through 2013 tax years and we currently beli possible that these examinations will be settled during 2018. We are also under audit or subject to audit with respect to income taxes foreign jurisdictions. It is reasonably possible that certain of these income tax examinations will be settled within the next twelve mo do not believe that the outcome of unresolved issues or claims will be material to our Consolidated Financial Stateme

At December 31, 2017 and 2016, net unrecognized tax benefits were $554 million and $485 million, respectively. Include December 31, 2017, were $445 million of tax positions that, if recognized, would impact the effective tax rate. The remaining unrecognized tax benefits principally relates to tax positions where the ultimate recognition is highly certain but there is uncertainty such recognition. Because of the impact of deferred income tax accounting, the differences in recognition periods would not affect t tax rate but would accelerate the payment of cash to the taxing authority to an earlier period. As of December 31, 2017, we do not e changes to the estimated amount of unrecognized tax benefits in the next twelve months.

(17) Dividend restrictions – Insurance subsidiaries

Payments of dividends by our insurance subsidiaries are restricted by insurance statutes and regulations. Without prior regul principal insurance subsidiaries may declare up to approximately $16 billion as ordinary dividends during 2018.

Combined shareholders’ equity of U.S. based insurance subsidiaries determined pursuant to statutory accounting rules (Su Policyholders) was approximately $170 billion at December 31, 2017 and $136 billion at December 31, 2016. Statutory surplus d corresponding amount based on GAAP due to differences in accounting for certain assets and liabilities. For instance, deferred cha assumed, deferred policy acquisition costs, unrealized gains on certain investments and related deferred income taxes are recognized for statutory reporting purposes. In addition, the carrying values of certain assets, such as goodwill and the carrying values of non- owned by our insurance subsidiaries, are not fully recognized for statutory reporting purposes.

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(18) Fair value measurements

Our financial assets and liabilities are summarized below as of December 31, 2017 and December 31, 2016 with fair values the fair value hierarchy (in millions). The carrying values of cash and cash equivalents, U.S. Treasury Bills, receivables and account and other liabilities are considered to be reasonable estimates of their fair values.

	Carrying Value	Fair Value	Quoted Prices (Level 1)	Significant Other Observable Inputs (Level 2)	Ur
December 31, 2017					
Investments in fixed maturity securities:					
U.S. Treasury, U.S. government corporations and agencies	$ 3,953	$ 3,953	$ 2,360	$ 1,593	
States, municipalities and political subdivisions	854	854	—	854	
Foreign governments	8,822	8,822	6,946	1,876	
Corporate bonds	6,862	6,862	—	6,856	
Mortgage-backed securities	862	862	—	862	
Investments in equity securities	170,540	170,540	170,494	46	
Investment in Kraft Heinz common stock	17,635	25,306	25,306	—	
Loans and finance receivables	13,748	14,136	—	17	
Derivative contract assets *(1)*	142	142	1	28	
Derivative contract liabilities:					
Railroad, utilities and energy *(1)*	82	82	3	69	
Equity index put options	2,172	2,172	—	—	
Notes payable and other borrowings:					
Insurance and other	27,324	28,180	—	28,180	
Railroad, utilities and energy	62,178	70,538	—	70,538	
Finance and financial products	13,085	13,582	—	13,577	
December 31, 2016					
Investments in fixed maturity securities:					
U.S. Treasury, U.S. government corporations and agencies	$ 4,527	$ 4,527	$ 3,099	$ 1,428	
States, municipalities and political subdivisions	1,216	1,216	—	1,216	
Foreign governments	9,001	9,001	7,237	1,764	
Corporate bonds	7,604	7,604	—	7,540	
Mortgage-backed securities	1,084	1,084	—	1,084	

Investments in equity securities	139,288	139,288	122,031	—
Investment in Kraft Heinz common stock	15,345	28,418	28,418	—
Loans and finance receivables	13,300	13,717	—	13
Derivative contract assets *(1)*	142	142	5	43
Derivative contract liabilities:				
Railroad, utilities and energy *(1)*	145	145	3	114
Equity index put options	2,890	2,890	—	—
Notes payable and other borrowings:				
Insurance and other	27,175	27,712	—	27,712
Railroad, utilities and energy	59,085	65,774	—	65,774
Finance and financial products	15,384	15,825	—	15,469

(1) *Assets are included in other assets and liabilities are included in accounts payable, accruals and other liabilities.*

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(18) Fair value measurements *(Continued)*

The fair values of substantially all of our financial instruments were measured using market or income approaches. The measuring fair value consists of Levels 1 through 3, which are described below.

Level 1 – Inputs represent unadjusted quoted prices for identical assets or liabilities exchanged in active mar

Level 2 – Inputs include directly or indirectly observable inputs (other than Level 1 inputs) such as quoted prices for similar exchanged in active or inactive markets; quoted prices for identical assets or liabilities exchanged in inactive markets; other considered in fair value determinations of the assets or liabilities, such as interest rates and yield curves, volatilities, prepay severities, credit risks and default rates; and inputs that are derived principally from or corroborated by observable market or other means. Pricing evaluations generally reflect discounted expected future cash flows, which incorporate yield curve with similar characteristics, such as credit ratings, estimated durations and yields for other instruments of the issuer or en industry sector.

Level 3 – Inputs include unobservable inputs used in the measurement of assets and liabilities. Management is required assumptions regarding unobservable inputs because there is little, if any, market activity in the assets or liabilities and it r corroborate the related observable inputs. Unobservable inputs require management to make certain projections and assur information that would be used by market participants in valuing assets or liabilities.

Reconciliations of assets and liabilities measured and carried at fair value on a recurring basis with the use of significant u (Level 3) for each of the three years ending December 31, 2017 follow (in millions).

	Investments in fixed maturity securities	Investments in equity securities	Net derivative contract liabilities
Balance December 31, 2014	$ 8	$ 21,996	$ (4,759)
Gains (losses) included in:			
Earnings	—	—	1,080
Other comprehensive income	(2)	(593)	(7)
Regulatory assets and liabilities	—	—	(19)
Acquisitions	101	—	—
Dispositions and settlements	(7)	—	(83)
Transfers into/out of Level 3	—	—	3
Balance December 31, 2015	100	21,403	(3,785)
Gains (losses) included in:			
Earnings	—	3,593	880
Other comprehensive income	(4)	876	(2)
Regulatory assets and liabilities	—	—	(11)
Acquisitions	10	—	—
Dispositions and settlements	(41)	(8,615)	(101)
Transfers into/out of Level 3	(1)	—	195
Balance December 31, 2016	64	17,257	(2,824)
Gains (losses) included in:			
Earnings	—	—	888
Other comprehensive income	1	1,156	(3)
Regulatory assets and liabilities	—	—	(1)
Dispositions and settlements	(59)	—	(129)
Transfers into/out of Level 3	—	(18,413)	—
Balance December 31, 2017	$ 6	$ —	$ (2,069)

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(18) Fair value measurements *(Continued)*

Gains and losses included in earnings are included as components of investment gains/losses, derivative gains/losses and c appropriate and are primarily related to changes in the values of derivative contracts and settlement transactions. Gains and losses comprehensive income are primarily the net change in unrealized appreciation of investments and the reclassification of investment earnings, as appropriate in our Consolidated Statements of Comprehensive Income.

As disclosed in Note 4, we exercised our BAC Warrants to acquire BAC common stock on August 24, 2017. As payment of the BAC common stock, we surrendered substantially all of our BAC Preferred. Additionally, RBI redeemed our RBI Preferred December 12, 2017. In the second quarter of 2017, we concluded the Level 3 inputs used in the previous fair value determinations of BAC Preferred Stock and RBI Preferred were not significant and we transferred these measurements from Level 3 to Level 2. In 2 preferred stock investment was disposed and our Dow preferred stock investment was converted into Dow common st

Quantitative information as of December 31, 2017, with respect to assets and liabilities measured and carried at fair value c with the use of significant unobservable inputs (Level 3) follows (in millions).

	Fair Value	Principal Valuation Techniques	Unobservable Inputs	Weighted Average
Derivative liabilities:				
Equity index put options	$ 2,172	Option pricing model	Volatility	17%

Our equity index put option contracts are illiquid and contain contract terms that are not standard in derivatives markets. Fo not required to post collateral under most of our contracts and certain of the contracts have relatively long durations. For these and classified these contracts as Level 3. The methods we use to value these contracts are those that we believe market participants would exchange prices with respect to our contracts.

We value equity index put option contracts based on the Black-Scholes option valuation model. Inputs to this model incl contract duration and dividend and interest rate inputs (including a Berkshire non-performance input) which are observable. Howev the valuation of long-duration options using any model is inherently subjective and, given the lack of observable transactions and p values may be subject to wide ranges. Volatility inputs represent our expectations, which consider the remaining duration of each co that the contracts will remain outstanding until the expiration dates. Increases or decreases in the volatility inputs will produce increa the fair values of the liabilities.

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(19) Common stock

Changes in Berkshire's issued, treasury and outstanding common stock during the three years ending December 31, 2017 ar below.

	Class A, $5 Par Value (1,650,000 shares authorized)			Class B, $0.0033 Par (3,225,000,000 shares au	
	Issued	Treasury	Outstanding	Issued	Treasury
Balance December 31, 2014	838,019	(11,680)	826,339	1,226,265,250	(1,409,762)
Conversions of Class A common stock to Class B common stock and exercises of replacement stock options issued in a business acquisition	(17,917)	—	(17,917)	27,601,348	—
Balance December 31, 2015	820,102	(11,680)	808,422	1,253,866,598	(1,409,762)
Conversions of Class A common stock to Class B common stock and exercises of replacement stock options issued in a business acquisition	(32,044)	—	(32,044)	49,457,329	—
Balance December 31, 2016	788,058	(11,680)	776,378	1,303,323,927	(1,409,762)
Conversions of Class A common stock to Class B common stock and exercises of replacement stock options issued in a business acquisition	(25,303)	—	(25,303)	38,742,822	—
Balance December 31, 2017	762,755	(11,680)	751,075	1,342,066,749	(1,409,762)

Each Class A common share is entitled to one vote per share. Class B common stock possesses dividend and distributio one-fifteen-hundredth (1/1,500) of such rights of Class A common stock. Each Class B common share possesses voting rights one-ten-thousandth (1/10,000) of the voting rights of a Class A share. Unless otherwise required under Delaware General Corporatio Class B common shares vote as a single class. Each share of Class A common stock is convertible, at the option of the holder, int Class B common stock. Class B common stock is not convertible into Class A common stock. On an equivalent Class A common sto 1,644,846 shares outstanding as of December 31, 2017 and 1,644,321 shares outstanding as of December 31, 2016. In addition to o 1,000,000 shares of preferred stock are authorized, but none are issued.

Berkshire's Board of Directors has approved a common stock repurchase program permitting Berkshire to repurchase its C shares at prices no higher than a 20% premium over the book value of the shares. The program allows share repurchases in the open privately negotiated transactions and does not specify a maximum number of shares to be repurchased. However, repurchases will n would reduce the total value of Berkshire's consolidated cash, cash equivalents and U.S. Treasury Bills holdings below $20 billion program does not obligate Berkshire to repurchase any specific dollar amount or number of Class A or Class B shares and there is n the program. There were no share repurchases under the program over the last three years.

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(20) Accumulated other comprehensive income

A summary of the net changes in after-tax accumulated other comprehensive income attributable to Berkshire Hathaway significant amounts reclassified from accumulated other comprehensive income into net earnings for each of the three years ending I follows (in millions).

	Unrealized appreciation of investments, net	Foreign currency translation	Prior service and actuarial gains/losses of defined benefit pension plans	Other	Accumulated other comprehensive income
Balance December 31, 2014	$ 45,636	$ (1,957)	$ (1,039)	$ 92	$ 42,732
Other comprehensive income, net before reclassifications	(5,522)	(2,027)	191	(112)	(7,470)
Reclassifications into net earnings	(1,516)	128	86	22	(1,280)
Balance December 31, 2015	38,598	(3,856)	(762)	2	33,982
Other comprehensive income, net before reclassifications	9,011	(1,412)	94	(48)	7,645
Reclassifications into net earnings	(4,433)	—	75	29	(4,329)
Balance December 31, 2016	43,176	(5,268)	(593)	(17)	37,298
Other comprehensive income, net before reclassifications	19,826	2,151	65	16	22,058
Reclassifications into net earnings	(909)	3	108	13	(785)
Balance December 31, 2017	$ 62,093	$ (3,114)	$ (420)	$ 12	$ 58,571
Reclassifications into net earnings:					
Year ending December 31, 2015:					
Investment gains/losses	$ (2,332)	$ 197	$ —	$ —	$ (2,135)
Other	—	—	129	35	164
Reclassifications before income taxes	(2,332)	197	129	35	(1,971)
Applicable income taxes	(816)	69	43	13	(691)
	$ (1,516)	$ 128	$ 86	$ 22	$ (1,280)
Year ending December 31, 2016:					
Investment gains/losses	$ (6,820)	$ —	$ —	$ —	$ (6,820)
Other	—	—	104	51	155
Reclassifications before income taxes	(6,820)	—	104	51	(6,665)
Applicable income taxes	(2,387)	—	29	22	(2,336)
	$ (4,433)	$ —	$ 75	$ 29	$ (4,329)
Year ending December 31, 2017:					
Investment gains/losses	$ (1,399)	$ —	$ —	$ —	$ (1,399)
Other	—	3	155	19	177
Reclassifications before income taxes	(1,399)	3	155	19	(1,222)
Applicable income taxes	(490)	—	47	6	(437)
	$ (909)	$ 3	$ 108	$ 13	$ (785)

Notes to Consolidated Financial Statements *(Continued)*

(21) Pension plans

Several of our subsidiaries sponsor defined benefit pension plans covering certain employees. Benefits under the plans are years of service and compensation, although benefits under certain plans are based on years of service and fixed benefit rates. Our make contributions to the plans to meet regulatory requirements and may also make discretionary contributions. The components o pension expense for each of the three years ending December 31, 2017 were as follows (in millions).

	2017	2016	2015
Service cost	$ 273	$ 282	$ 266
Interest cost	635	691	591
Expected return on plan assets	(939)	(908)	(782)
Amortization of actuarial losses and other	157	148	179
Net periodic pension expense	$ 126	$ 213	$ 254

The accumulated benefit obligation is the actuarial present value of benefits earned based on service and compensation pri date. The projected benefit obligation ("PBO") is the actuarial present value of benefits earned based upon service and compensa valuation date and, if applicable, includes assumptions regarding future compensation levels. Benefit obligations under qualified U. pension plans are funded through assets held in trusts. Pension obligations under certain non-U.S. plans and non-qualified U.S. plans the aggregate PBOs of such plans were approximately $1.3 billion and $1.2 billion as of December 31, 2017 and 2016, resp

Reconciliations of the changes in plan assets and PBOs related to BHE's pension plans and all other pension plans for eacl ending December 31, 2017 are in the following tables (in millions). The costs of pension plans covering employees of certain regula BHE are generally recoverable through the regulated rate making process.

	2017			2016		
	BHE	All other	Consolidated	BHE	All other	Consolidated
Benefit obligations						
Accumulated benefit obligation end of year	$ 4,920	$ 12,604	$ 17,524	$ 4,787	$ 11,912	$ 16,699
PBO beginning of year	$ 5,077	$ 12,673	$ 17,750	$ 5,076	$ 10,183	$ 15,259
Service cost	47	226	273	49	233	282
Interest cost	174	461	635	198	493	691
Benefits paid	(271)	(626)	(897)	(309)	(705)	(1,014)
Business acquisitions	—	—	—	—	2,684	2,684
Actuarial (gains) or losses and other	180	883	1,063	63	(215)	(152)
PBO end of year	$ 5,207	$ 13,617	$ 18,824	$ 5,077	$ 12,673	$ 17,750
Plan assets						
Plan assets beginning of year	$ 4,694	$ 10,703	$ 15,397	$ 4,765	$ 8,066	$ 12,831
Employer contributions	122	159	281	133	214	347
Benefits paid	(271)	(626)	(897)	(309)	(705)	(1,014)
Actual return on plan assets	535	1,601	2,136	512	1,083	1,595
Business acquisitions	—	—	—	—	2,314	2,314
Other	49	48	97	(407)	(269)	(676)
Plan assets end of year	$ 5,129	$ 11,885	$ 17,014	$ 4,694	$ 10,703	$ 15,397
Funded status – net liability	$ 78	$ 1,732	$ 1,810	$ 383	$ 1,970	$ 2,353

The funded status of our defined benefit pension plans at December 31, 2017 reflected in assets was $1,176 million and $2,986 million. At December 31, 2016, the funded status included in assets was $644 million and in liabilities was $2,997

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(21) Pension plans *(Continued)*

Weighted average interest rate assumptions used in determining PBOs and net periodic pension expense were as

	2017	2016	2015
Applicable to pension benefit obligations:			
Discount rate	3.3%	3.8%	4.1%
Expected long-term rate of return on plan assets	6.4	6.1	6.5
Rate of compensation increase	2.8	3.0	3.4
Discount rate applicable to net periodic pension expense	3.9	4.2	3.8

Benefits payments expected over the next ten years are as follows (in millions): 2018 – $1,058; 2019 – $1,004; 2020 – $1,0
2022 – $1,019; and 2023 to 2027 – $5,095. Sponsoring subsidiaries expect to contribute $251 million to defined benefit pension

Fair value measurements of plan assets as of December 31, 2017 and 2016 follow (in millions).

	Fair Value				Investment funds and partnerships at net asset value
	Total	Level 1	Level 2	Level 3	
December 31, 2017					
Cash and equivalents	$ 738	$ 594	$ 144	$ —	$ —
Equity securities	9,824	9,641	23	160	—
Government obligations	1,536	1,497	39	—	—
Other fixed maturity securities	799	148	619	32	—
Investment funds and other	4,117	150	1,501	274	2,192
	$ 17,014	$ 12,030	$ 2,326	$ 466	$2,192
December 31, 2016					
Cash and equivalents	$ 847	$ 637	$ 210	$ —	$ —
Equity securities	8,645	8,476	27	142	—
Government obligations	1,291	1,076	215	—	—
Other fixed maturity securities	770	144	595	31	—
Investment funds and other	3,844	233	1,434	153	2,024
	$ 15,397	$ 10,566	$ 2,481	$ 326	$2,024

Refer to Note 18 for a discussion of the three levels in the hierarchy of fair values. Plan assets are generally invested wit
objective of producing earnings to adequately cover expected benefit obligations, while assuming a prudent level of risk. Allocation
result of changing market conditions and investment opportunities. The expected rates of return on plan assets reflect subjective asses
invested asset returns over a period of several years. Generally, past investment returns are not given significant consideration wh
assumptions for expected long-term rates of return on plan assets. Actual experience will differ from the assumed rat

A reconciliation of the pre-tax accumulated other comprehensive income (loss) related to defined benefit pension plans fo
years ending December 31, 2017 follows (in millions).

	2017	2016
Balance beginning of year	$ (839)	$ (1,193)
Amount included in net periodic pension expense	155	104
Actuarial gains and other	70	250
Balance end of year	$ (614)	$ (839)

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(21) Pension plans *(Continued)*

Several of our subsidiaries also sponsor defined contribution retirement plans, such as 401(k) or profit sharing plans. Empl
are subject to regulatory limitations and the specific plan provisions. Several plans provide for employer matching contributions up t
the plans and provide for additional discretionary contributions as determined by management. Employer contributions expensed w
defined contribution plans were $1,001 million in 2017, $912 million in 2016 and $739 million in 2015.

(22) Contingencies and Commitments

We are parties in a variety of legal actions that routinely arise out of the normal course of business, including legal actions s
liability directly through insurance contracts or indirectly through reinsurance contracts issued by Berkshire subsidiaries. Plaintiffs
punitive or exemplary damages. We do not believe that such normal and routine litigation will have a material effect on our financial
of operations. Berkshire and certain of its subsidiaries are also involved in other kinds of legal actions, some of which assert or ma
seek to impose fines and penalties. We believe that any liability that may arise as a result of other pending legal actions will not have
our consolidated financial condition or results of operations.

We lease certain manufacturing, warehouse, retail and office facilities as well as certain equipment. Rent expense under op
$1,579 million in 2017, $1,573 million in 2016 and $1,516 million in 2015. Future minimum rental payments for operating le
non-cancellable terms in excess of one year are as follows (in millions).

2018	2019	2020	2021	2022	After 2022	Total
$1,330	$1,192	$1,067	$872	$709	$3,316	$8,486

Our subsidiaries regularly make commitments in the ordinary course of business to purchase goods and services used in th
most significant of these relate to our railroad, utilities and energy businesses and our fractional aircraft ownership business. As of D
estimated future payments under such arrangements were as follows: $13.0 billion in 2018, $3.8 billion in 2019, $3.1 billion in 20
2021, $2.4 billion in 2022 and $15.0 billion after 2022.

In 2016, NICO entered into a definitive agreement to acquire Medical Liability Mutual Insurance Company ("MLMIC"), a
professional liability insurance domiciled in New York. MLMIC reported assets and policyholders' surplus determined under statu
principles as of September 30, 2017 were approximately $5.8 billion and $2.2 billion, respectively. The acquisition price will be ap
billion. The acquisition will involve the conversion of MLMIC from a mutual company to a stock company. The closing of the trans
various regulatory approvals and customary closing conditions and the approval of the MLMIC policyholders eligible to vote o
demutualization and sale. We currently expect this acquisition will be completed in the third quarter of 2018.

On October 3, 2017, we entered into an investment agreement and an equity purchase agreement whereby we acquired a 38.
Travel Centers LLC, d/b/a Pilot Flying J ("Pilot Flying J"). Pilot Flying J, headquartered in Knoxville, Tennessee, is one of the larges
centers in North America, with more than 27,000 team members, 750 locations across the U.S. and Canada, and approximately $20
revenues. The Haslam family currently owns a 50.1% interest in Pilot Flying J and a third party owns the remaining 11.3% interest. V
an agreement to acquire in 2023 an additional 41.4% interest in Pilot Flying J with the Haslam family retaining a 20% interest. As a
will become the majority owner of Pilot Flying J in 2023.

We own a 50% interest in a joint venture, Berkadia Commercial Mortgage LLC ("Berkadia"), with Leucadia National
("Leucadia") owning the other 50% interest. Berkadia is a servicer of commercial real estate loans in the U.S., performing primary,
servicing functions for U.S. government agency programs, commercial mortgage-backed securities transactions, banks, insurance co
financial institutions. A significant source of funding for Berkadia's operations is through the issuance of commercial paper, which
surety policy issued by a Berkshire insurance subsidiary. Leucadia is obligated to indemnify us for one-half of any losses incurred
Berkadia's maximum outstanding balance of commercial paper borrowings is currently limited to $1.5 billion. On December 31, 2
commercial paper outstanding was $1.47 billion.

(22) Contingencies and Commitments *(Continued)*

Pursuant to the terms of agreements with noncontrolling shareholders in our less than wholly-owned subsidiaries, we ma acquire their equity interests. If we acquired all outstanding noncontrolling interests as of December 31, 2017, we estimate the cost approximately $5.3 billion. However, the timing and the amount of any such future payments that might be required are contingent o the noncontrolling owners.

(23) Business segment data

Our operating businesses include a large and diverse group of insurance, finance, manufacturing, service and retailing busin our reportable business segments in a manner that reflects how management views those business activities. Certain businesses are g segment reporting based upon similar products or product lines, marketing, selling and distribution characteristics, even though thos operated under separate local management.

The tabular information that follows shows data of reportable segments reconciled to amounts reflected in our Consolid Statements. Intersegment transactions are not eliminated from segment results when management considers those transactions in asse the respective segments. Furthermore, our management does not consider investment and derivative gains/losses, amortization of accounting adjustments related to Berkshire’s business acquisitions or certain other corporate income and expense items in assess performance of operating units. Collectively, these items are included in reconciliations of segment amounts to consolidated

Business Identity	Business Activity
Insurance:	
GEICO	Underwriting private passenger automobile insurance mainly by direct response met
Berkshire Hathaway Reinsurance Group	Underwriting excess-of-loss, quota-share and facultative reinsurance worldwide (General Re Group
Berkshire Hathaway Primary Group	Underwriting multiple lines of property and casualty insurance policies for primarily commer
BNSF	Operation of one of the largest railroad systems in North America
Berkshire Hathaway Energy	Regulated electric and gas utility, including power generation and distribution activities and real activities
Manufacturing	Manufacturers of numerous products including industrial, consumer and building pro
McLane Company	Wholesale distribution of groceries and non-food items
Service and retailing	Providers of numerous services including fractional aircraft ownership programs, aviation pilot tr components distribution and various retailing businesses, including automotive dealer
Finance and financial products	Manufactured housing and related consumer financing, transportation equipment, manufacturing furniture leasing

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(23) Business segment data *(Continued)*

A disaggregation of our consolidated data for each of the three most recent years is presented in the tables which follow

	Revenues			Earnings before income taxes		
	2017	**2016**	**2015**	**2017**	**2016**	**2015**
Operating Businesses:						
Insurance:						
Underwriting:						
GEICO	$ 29,441	$ 25,483	$ 22,718	$ (310)	$ 462	$ 460
Berkshire Hathaway Reinsurance Group	24,013	14,141	13,182	(3,648)	1,012	553
Berkshire Hathaway Primary Group	7,143	6,257	5,394	719	657	824
Insurance underwriting	60,597	45,881	41,294	(3,239)	2,131	1,837
Investment income	4,911	4,522	4,562	4,902	4,482	4,550
Total insurance	65,508	50,403	45,856	1,663	6,613	6,387
BNSF	21,387	19,829	21,967	6,328	5,693	6,775
Berkshire Hathaway Energy	18,939	17,859	18,231	2,584	2,973	2,851
Manufacturing	50,445	46,506	36,136	6,861	6,211	4,893
McLane Company	49,775	48,075	48,223	299	431	502
Service and retailing	26,313	25,478	23,466	2,083	1,820	1,720
Finance and financial products	8,376	7,675	6,964	2,058	2,130	2,086
	240,743	215,825	200,843	21,876	25,871	25,214
Reconciliation to consolidated amount:						
Investment and derivative gains/losses	2,128	8,304	10,347	2,128	8,304	10,347
Interest expense, not allocated to segments	—	—	—	(1,494)	(230)	(374)
Investments in Kraft Heinz	—	180	852	2,938	1,103	730
Corporate, eliminations and other	(734)	(705)	(1,099)	(1,610)	(1,381)	(971)
	$ 242,137	$ 223,604	$ 210,943	$ 23,838	$ 33,667	$ 34,946

	Interest expense			Income tax expense		
	2017	**2016**	**2015**	**2017**	**2016**	**201**
Operating Businesses:						
Insurance	$ —	$ —	$ —	$ (55)	$ 1,585	$ 1,
BNSF	1,016	992	928	2,369	2,124	2,
Berkshire Hathaway Energy	2,254	1,715	1,830	178	403	4
Manufacturing	189	164	50	2,155	1,945	1,
McLane Company	19	—	13	94	169	1
Service and retailing	56	50	40	726	669	6
Finance and financial products	397	411	384	723	702	7
	3,931	3,332	3,245	6,190	7,597	7,
Reconciliation to consolidated amount:						
Investment and derivative gains/losses	—	—	—	742	1,807	3,
Interest expense, not allocated to segments	1,494	230	374	(523)	(81)	(
Investments in Kraft Heinz	—	—	—	832	397	(
Income tax net benefit – Tax Cuts and Jobs Act of 2017	—	—	—	(28,200)	—	–
Corporate, eliminations and other	(31)	(65)	(104)	(556)	(480)	(4
	$ 5,394	$ 3,497	$ 3,515	$ (21,515)	$ 9,240	$ 10

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Notes to Consolidated Financial Statements *(Continued)*

(23) Business segment data *(Continued)*

	Capital expenditures			Depreciation of tangible assets		
	2017	2016	2015	2017	2016	2015
Operating Businesses:						
Insurance	$ 170	$ 128	$ 115	$ 84	$ 85	$ 77
BNSF	3,256	3,819	5,651	2,304	2,079	1,932
Berkshire Hathaway Energy	4,571	5,090	5,875	2,548	2,560	2,451
Manufacturing	1,905	1,813	1,292	1,357	1,287	938
McLane Company	289	258	338	193	165	161
Service and retailing	587	804	574	583	611	504
Finance and financial products	930	1,042	2,237	650	624	610
	$ 11,708	$ 12,954	$ 16,082	$ 7,719	$ 7,411	$ 6,673

	Goodwill at year-end		Identifiable assets at year-end		
	2017	2016	2017	2016	2015
Operating Businesses:					
Insurance	$ 15,499	$ 15,474	$ 297,048	$ 234,037	$ 219,451
BNSF	14,845	14,845	69,438	69,277	66,613
Berkshire Hathaway Energy	9,935	9,266	80,195	76,428	74,221
Manufacturing	32,981	32,041	72,630	69,900	34,141
McLane Company	734	734	6,090	5,896	5,871
Service and retailing	5,771	5,745	18,215	17,450	16,299
Finance and financial products	1,493	1,381	40,392	40,329	37,621
	$ 81,258	$ 79,486	584,008	513,317	454,217
Reconciliation to consolidated amount:					
Corporate and other			36,829	28,051	35,332
Goodwill			81,258	79,486	62,708
			$ 702,095	$ 620,854	$ 552,257

Premiums written and earned by the property/casualty and life/health insurance businesses are summarized below (i

	Property/Casualty			Life/Health		
	2017	2016	2015	2017	2016	2015
Premiums Written:						
Direct	$ 39,377	$ 34,001	$ 30,544	$ 866	$ 1,060	$ 821
Assumed	17,815	8,037	7,049	4,925	4,672	5,187
Ceded	(694)	(798)	(877)	(47)	(62)	(57)
	$ 56,498	$ 41,240	$ 36,716	$ 5,744	$ 5,670	$ 5,951
Premiums Earned:						
Direct	$ 37,755	$ 33,207	$ 29,608	$ 866	$ 1,060	$ 821
Assumed	17,813	7,848	6,584	4,866	4,671	5,192
Ceded	(677)	(843)	(854)	(26)	(62)	(57)
	$ 54,891	$ 40,212	$ 35,338	$ 5,706	$ 5,669	$ 5,956

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(23) Business segment data *(Continued)*

Insurance premiums written by geographic region (based upon the domicile of the insured or reinsured) are summarized be millions.

	Property/Casualty			Life/Health		
	2017	2016	2015	2017	2016	2015
United States	$ 50,604	$ 35,878	$ 31,171	$ 3,320	$ 3,473	$ 3,247
Asia Pacific	3,307	3,616	3,472	879	715	673
Western Europe	1,516	1,406	1,638	909	822	1,263
All other	1,071	340	435	636	660	768
	$ 56,498	$ 41,240	$ 36,716	$ 5,744	$ 5,670	$ 5,951

Consolidated sales and service revenues were $132.9 billion in 2017, $125.7 billion in 2016 and $112.4 billion in 2015. In 2 of such revenues were attributable to the United States compared to 87% in 2015. The remainder of sales and service revenues were p Canada and the Asia Pacific. Consolidated sales and service revenues included sales to Walmart Stores, Inc. of approximately $14 b 2016 and $13 billion in 2015. Approximately 95% of our revenues for each of the last three years from railroad, utilities and energy the United States. At December 31, 2017, approximately 89% of our consolidated net property, plant and equipment was located in with the remainder primarily in Canada and Europe.

(24) Quarterly data

A summary of revenues and net earnings by quarter for each of the last two years follows. This information is unaudited. millions, except per share amounts.

	1st Quarter	2nd Quarter	3rd Quarter
2017			
Revenues	$ 65,187	$ 57,518	$ 60,525
Net earnings attributable to Berkshire shareholders *	4,060	4,262	4,067
Net earnings attributable to Berkshire shareholders per equivalent Class A common share	2,469	2,592	2,473
2016			
Revenues	$ 52,163	$ 54,254	$ 58,843
Net earnings attributable to Berkshire shareholders *	5,589	5,001	7,198
Net earnings attributable to Berkshire shareholders per equivalent Class A common share	3,401	3,042	4,379

* *Includes after-tax investment and derivative gains/losses and a one-time income tax net benefit attributable to the enactment of the Act of 2017 as follows:*

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Investment and derivative gains/losses – 2017	$ 504	$ 143	$ 623	$ 107
Investment and derivative gains/losses – 2016	1,852	394	2,347	1,904
Income tax net benefit – Tax Cuts and Jobs Act of 2017	—	—	—	28,200

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Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None

Item 9A. Controls and Procedures

At the end of the period covered by this Annual Report on Form 10-K, the Corporation carried out an evaluation, under the su the participation of the Corporation's management, including the Chairman (Chief Executive Officer) and the Senior Vice Presiden Officer), of the effectiveness of the design and operation of the Corporation's disclosure controls and procedures pursuant to Exchang Based upon that evaluation, the Chairman (Chief Executive Officer) and the Senior Vice President (Chief Financial Officer) con Corporation's disclosure controls and procedures are effective in timely alerting them to material information relating to the Corpora consolidated subsidiaries) required to be included in the Corporation's periodic SEC filings. The report called for by Item 308(a) of incorporated herein by reference to Management's Report on Internal Control Over Financial Reporting, included on page K-60 o attestation report called for by Item 308(b) of Regulation S-K is incorporated herein by reference to Report of Independent Reg Accounting Firm, included on page K-61 of this report. There has been no change in the Corporation's internal control over financia the quarter ended December 31, 2017 that has materially affected, or is reasonably likely to materially affect, the Corporation's inte financial reporting.

Item 9B. Other Information

None

Part III

Except for the information set forth under the caption "Executive Officers of the Registrant" in Part I hereof, information re (Items 10, 11, 12, 13 and 14) is incorporated by reference from the Registrant's definitive proxy statement, filed pursuant to Regula Annual Meeting of Shareholders of the Registrant to be held on May 5, 2018, which meeting will involve the election of d

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Part IV

Item 15. Exhibits and Financial Statement Schedules

(a)1. *Financial Statements*

The following Consolidated Financial Statements, as well as the Report of Independent Registered Public Accounting Firm, a
II Item 8 of this report:

2. *Financial Statement Schedule*

Other schedules are omitted because they are not required, information therein is not applicable, or is reflected in the Consolidated F
Statements or notes thereto.

(b) *Exhibits*

See the "Exhibit Index" at page K-108.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of
Berkshire Hathaway Inc.
Omaha, Nebraska

We have audited the consolidated financial statements of Berkshire Hathaway Inc. and subsidiaries (the "Company") as
2017 and 2016, and for each of the three years in the period ended December 31, 2017, and the Company's internal control over finan
December 31, 2017, and have issued our report thereon dated February 23, 2018; such consolidated financial statements and repo
elsewhere in this Form 10-K. Our audits also included the financial statement schedule of the Company listed in the Index at Item
statement schedule is the responsibility of the Company's management. Our responsibility is to express an opinion on the Comp
statements schedules based on our audits. In our opinion, such financial statement schedules, when considered in relation to the fin
taken as a whole, present fairly, in all material respects, the information set forth therein.

/s/ Deloitte & Touche LLP
Omaha, Nebraska
February 23, 2018

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BERKSHIRE HATHAWAY INC.
(Parent Company)
Condensed Financial Information
(Dollars in millions)

Schedule I

Balance Sheets

	December 31, 2017	December 31, 2016
Assets:		
Cash and cash equivalents	$ 4,039	$ 3,221
Short-term investments in U.S. Treasury Bills	13,132	8,220
Investments in fixed maturity and equity securities and other assets	79	59
Investments in and advances to/from consolidated subsidiaries	335,668	276,467
Investments in The Kraft Heinz Company	17,635	15,345
	$ 370,553	$ 303,312
Liabilities and Shareholders' Equity:		
Accounts payable, accrued interest and other liabilities	$ 196	$ 182
Income taxes, principally deferred	3,294	3,357
Notes payable and other borrowings	18,767	17,703
	22,257	21,242
Berkshire Hathaway shareholders' equity	348,296	282,070
	$ 370,553	$ 303,312

Statements of Earnings and Comprehensive Income

	Year ended December 31, 2017	2016	2015
Income items:			
From consolidated subsidiaries:			
Dividends	$ 5,367	$ 9,862	$ 10,519
Undistributed earnings	37,832	13,264	8,508
	43,199	23,126	19,027
Investment gains/losses	(1)	700	16
Investment holding gain in The Kraft Heinz Company	—	—	6,838
Equity in net earnings of The Kraft Heinz Company	2,938	923	(122)
Other income	350	262	963
	46,486	25,011	26,722
Cost and expense items:			
General and administrative	159	80	73
Interest expense	1,530	208	302
Income taxes	(143)	649	2,264
	1,546	937	2,639
Net earnings attributable to Berkshire Hathaway shareholders	44,940	24,074	24,083
Other comprehensive income attributable to Berkshire Hathaway shareholders	21,273	3,316	(8,750)
Comprehensive income attributable to Berkshire Hathaway shareholders	$ 66,213	$ 27,390	$ 15,333

See Note to Condensed Financial Information

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BERKSHIRE HATHAWAY INC.
(Parent Company)
Condensed Financial Information
(Dollars in millions)
Schedule I (continued)
Statements of Cash Flows

	Year ended December 31, 2017	2016	2015
Cash flows from operating activities:			
Net earnings attributable to Berkshire Hathaway shareholders	$ 44,940	$ 24,074	$ 24,083
Adjustments to reconcile net earnings to cash flows from operating activities:			
Investment gains/losses	1	(700)	(6,854)
Undistributed earnings of consolidated subsidiaries	(37,832)	(13,264)	(8,508)
Non-cash dividends from consolidated subsidiaries	—	—	(3,938)
Income taxes payable	(135)	629	2,227
Other	(1,234)	(161)	222
Net cash flows from operating activities	5,740	10,578	7,232
Cash flows from investing activities:			
Redemption (purchase) of Kraft Heinz Company investments	—	8,320	(5,258)
Investments in and advances to/repayments from consolidated subsidiaries, net	(239)	(26,398)	(2,274)
Purchases of U.S. Treasury Bills	(19,663)	(9,350)	—
Sales and maturities of U.S. Treasury Bills	14,847	1,145	—
Net cash flows from investing activities	(5,055)	(26,283)	(7,532)
Cash flows from financing activities:			
Proceeds from borrowings	1,201	9,278	3,165
Repayments of borrowings	(1,145)	(1,125)	(1,775)
Other	77	164	70
Net cash flows from financing activities	133	8,317	1,460
Increase (decrease) in cash and cash equivalents	818	(7,388)	1,160
Cash and cash equivalents at beginning of year	3,221	10,609	9,449
Cash and cash equivalents at end of year	$ 4,039	$ 3,221	$ 10,609
Other cash flow information:			
Income taxes paid	$ 2,076	$ 3,583	$ 3,180
Interest paid	386	307	206
Non-cash investments in consolidated subsidiaries	—	—	3,938

Note to Condensed Financial Information

In December 2017, the Tax Cuts and Jobs Act of 2017 (“TCJA”) was enacted, which reduced the Parent Company’s income t by $550 million, primarily due to the reduction in deferred tax liabilities attributable to the lower U.S. statutory rate, partly offset by tax expense on certain accumulated undistributed earnings of foreign subsidiaries. The effects of the TCJA on income tax expense subsidiaries is included in undistributed earnings in consolidated subsidiaries.

In 2013, the Parent Company invested $12.25 billion in H.J. Heinz Holding Corporation (“Heinz Holding”), an entity form Heinz Company, which included common stock and warrants and cumulative compounding preferred stock. After a series of trans Berkshire’s interests in Heinz Holding became a 26.8% ownership of outstanding common stock of The Kraft Heinz Company (“K currently 26.7% of such shares. Reference is made to Note 5 to the Consolidated Financial Statements for additional information con investments in Kraft Heinz.

In January 2017, Berkshire issued €1.1 billion in senior notes consisting of €550 million of 0.25% notes due in 2021 and €55 notes due in 2023, which increased Euro denominated notes to €6.85 billion. In 2017, the carrying value of Berkshire’s Euro denom increased $990 million due to changes in the Euro/U.S. Dollar exchange rates. This increase produced a corresponding charge to p $990 million in 2017. Parent Company debt maturities over the next five years are as follows: 2018—$1,550 million; 2019—$753 $1,203 million; 2021—$2,160 million and 2022—$613 million. Berkshire guarantees debt obligations of certain of its subsidiari

December 31, 2017, totaled approximately $14.8 billion. Such guarantees are an absolute, unconditional and irrevocable guarante
prompt payment when due of all present and future payment obligations. Berkshire also provides guarantees in connection with equi
contracts and certain retroactive reinsurance contracts of subsidiaries. The amounts of subsidiary payments under these contracts, if
upon the outcome of future events.

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EXHIBIT INDEX

Exhibit No.	
2(i)	Agreement and Plan of Merger dated as of June 19, 1998 between Berkshire and General Re Corporatio Incorporated by reference to Annex I to Registration Statement No. 333-61129 filed on Form S-4.
2(ii)	Agreement and Plan of Merger dated as of November 2, 2009 by and among Berkshire, R Acquisition Company, LL Incorporated by reference to Annex A to Registration Statement No. 333-163343 on Form S-4.
2(iii)	Agreement and Plan of Merger dated August 8, 2015, by and among Berkshire, NW Merger Sub Inc. and Precision Cast (“PCC”) Incorporated by reference to Exhibit 2.1 to PCC’s Current Report on Form 8-K filed on August 10, 2015 (SEC File
3(i)	Restated Certificate of Incorporation Incorporated by reference to Exhibit 3(i) to Form 10-K filed on March 2, 2015.
3(ii)	By-Laws Incorporated by reference to Exhibit 3(ii) to Form 8-K filed on May 4, 2016.
4.1	Indenture, dated as of December 22, 2003, between Berkshire Hathaway Finance Corporation, Berkshire Hathaway Inc. New York Mellon Trust Company, N.A. (as successor to J.P. Morgan Trust Company, National Association), Incorporated by reference to Exhibit 4.1 on Form S-4 of Berkshire Hathaway Finance Corporation and Berkshire H on February 4, 2004. SEC File No. 333-112486
4.2	Indenture, dated as of February 1, 2010, among Berkshire Hathaway Inc., Berkshire Hathaway Finance Corporation and York Mellon Trust Company, N.A., as trustee. Incorporated by reference to Exhibit 4.1 to Berkshire’s Registration Statement on Form S-3 filed on February 1, No. 333-164111
4.3	Indenture, dated as of January 26, 2016, by and among Berkshire Hathaway Inc., Berkshire Hathaway Finance Corporatio New York Mellon Trust Company, N.A., as trustee. Incorporated by reference to Exhibit 4.1 to Berkshire’s Registration Statement on Form S-3 filed on January 26, No. 333-209122
4.4	Indenture, dated as of December 1, 1995, between BNSF and The First National Bank of Chicago, as trus Incorporated by reference to Exhibit 4 on Form S-3 of BNSF filed on February 8, 1999.
4.5	Indenture, dated as of October 4, 2002, by and between MidAmerican Energy Holdings Company and The Bank of Ne Incorporated by reference to Exhibit 4.1 to the Berkshire Hathaway Energy Company Registration Statement No. 3 December 6, 2002.
	Other instruments defining the rights of holders of long-term debt of Registrant and its subsidiaries are not being f amount of securities authorized by all other such instruments does not exceed 10% of the total assets of the Reg subsidiaries on a consolidated basis as of December 31, 2017. The Registrant hereby agrees to furnish to the Co request a copy of any such debt instrument to which it is a party.
10.1	Equity Commitment Letter of Berkshire Hathaway Inc. with Hawk Acquisition Holding Corporation dated Februar Incorporated by reference to Exhibit 10.1 on Form 8-K of Berkshire Hathaway Inc. filed on February 14
12	Calculation of Ratio of Consolidated Earnings to Consolidated Fixed Charges
14	Code of Ethics Berkshire’s Code of Business Conduct and Ethics is posted on its Internet website at *www.berkshirehatha*
18	Letter re change in accounting principle
21	Subsidiaries of Registrant
23	Consent of Independent Registered Public Accounting Firm
31.1	Rule 13a—14(a)/15d-14(a) Certification
31.2	Rule 13a—14(a)/15d-14(a) Certification
32.1	Section 1350 Certification
32.2	Section 1350 Certification
95	Mine Safety Disclosures

101	The following financial information from Berkshire Hathaway Inc.'s Annual Report on Form 10-K for the year ended De formatted in XBRL (Extensible Business Reporting Language) includes: (i) the Consolidated Balance Sheets as of Decem 2016, (ii) the Consolidated Statements of Earnings for each of the three years ended December 31, 2017, 2016 and 2015, Statements of Comprehensive Income for each of the three years ended December 31, 2017, 2016 and 2015, (iv) the Statements of Changes in Shareholders' Equity for each of the three years ended December 31, 2017, 2016 and 2015, (v Statements of Cash Flows for each of the three years ended December 31, 2017, 2016 and 2015 and (vi) the Notes to Con Statements and Schedule I, tagged in summary and detail.

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SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused
signed on its behalf by the undersigned thereunto duly authorized.

BERKSHIRE HATHAWAY INC.

Date: February 23, 2018 /S/ MARC D. HAMBURG

Marc D. Hamburg
Senior Vice President and
Principal Financial Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following pers
Registrant and in the capacities and on the dates indicated.

/S/ WARREN E. BUFFETT **Warren E. Buffett**	Chairman of the Board of Directors—Chief Executive Officer	February 23, 2018 Date
/S/ GREGORY E. ABEL **Gregory E. Abel**	Director—Vice Chairman—Non Insurance Operations	February 23, 2018 Date
/S/ HOWARD G. BUFFETT **Howard G. Buffett**	Director	February 23, 2018 Date
/S/ STEPHEN B. BURKE **Stephen B. Burke**	Director	February 23, 2018 Date
/S/ SUSAN L. DECKER **Susan L. Decker**	Director	February 23, 2018 Date
/S/ WILLIAM H. GATES III **William H. Gates III**	Director	February 23, 2018 Date
/S/ DAVID S. GOTTESMAN **David S. Gottesman**	Director	February 23, 2018 Date
/S/ CHARLOTTE GUYMAN **Charlotte Guyman**	Director	February 23, 2018 Date
/S/ AJIT JAIN **Ajit Jain**	Director—Vice Chairman—Insurance Operations	February 23, 2018 Date
/S/ CHARLES T. MUNGER **Charles T. Munger**	Director—Vice Chairman	February 23, 2018 Date
/S/ THOMAS S. MURPHY **Thomas S. Murphy**	Director	February 23, 2018 Date
/S/ RONALD L. OLSON **Ronald L. Olson**	Director	February 23, 2018 Date
/S/ WALTER SCOTT, JR. **Walter Scott, Jr.**	Director	February 23, 2018 Date
/S/ MERYL B. WITMER **Meryl B. Witmer**	Director	February 23, 2018 Date
/S/ MARC D. HAMBURG **Marc D. Hamburg**	Senior Vice President—Principal Financial Officer	February 23, 2018 Date
/S/ DANIEL J. JAKSICH **Daniel J. Jaksich**	Vice President—Principal Accounting Officer	February 23, 2018 Date