

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
State or other jurisdiction of
incorporation or organization
3555 Farnam Street, Omaha, Nebraska
(Address of principal executive office)

47-0813844
(I.R.S. Employer
Identification No.)
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	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.

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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 multinational 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 parts 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*®, *Qutitec*®, *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.

Mammon Holdings

Mammon Holdings, Inc. ("Mammon") is a global industrial organization comprising 11 diverse business sectors and more than 100 autonomous manufacturing and service businesses. Mammon acquired the Colson Medical Companies as of October 31, 2019, which comprise Mammon's Medical sector. Mammon'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. Mammon'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.

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.

Berkshire's industrial products manufacturers employ approximately 83,000 persons.

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 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*®, *BORN*®, *B•O•C*®, *Carolina*®, *EuroSoft*, *Söffi*, *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 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, LeachCamer, 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.

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 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.

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, stoneware, 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:

Business	Country	Locations	Property/Facility type	Number of Properties	
				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.		Offices/Warehouses	30	26
			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.

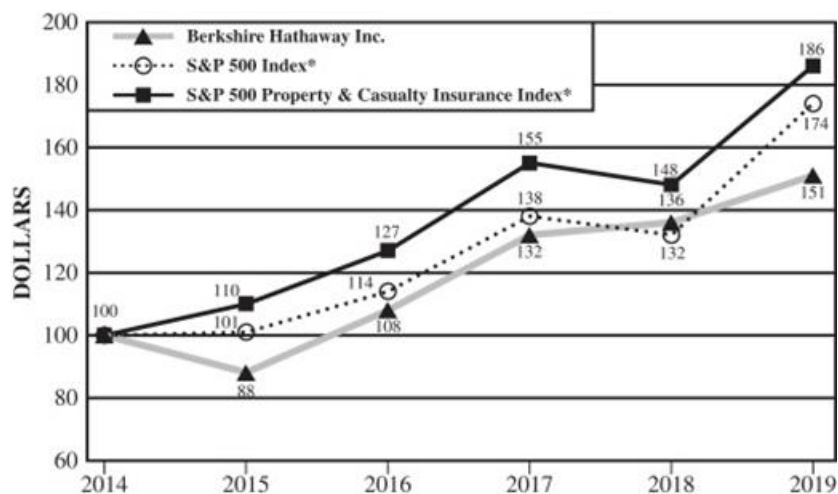
Period	Total number of shares purchased	Average price paid per share	Total number of shares purchased as part of publicly announced program	Maximum number or value of shares that yet may be repurchased under the program
October 1 through October 9:				
Class A common stock	688	\$ 306,086.60	688	*
Class 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**



* 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	<u>\$ 254,616</u>	<u>\$ 247,837</u>	<u>\$ 239,933</u>	<u>\$ 215,114</u>	<u>\$ 200,441</u>
Investment and derivative gains/losses	<u>\$ 72,607</u>	<u>\$ (22,455)</u>	<u>\$ 2,128</u>	<u>\$ 8,304</u>	<u>\$ 10,347</u>
Earnings:					
Net earnings attributable to Berkshire Hathaway (1)	<u>\$ 81,417</u>	<u>\$ 4,021</u>	<u>\$ 44,940</u>	<u>\$ 24,074</u>	<u>\$ 24,083</u>
Net earnings per share attributable to Berkshire Hathaway shareholders (2)	<u>\$ 49,828</u>	<u>\$ 2,446</u>	<u>\$ 27,326</u>	<u>\$ 14,645</u>	<u>\$ 14,656</u>
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	<u>\$ 261,417</u>	<u>\$ 212,503</u>	<u>\$ 211,750</u>	<u>\$ 171,542</u>	<u>\$ 154,935</u>

- (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.

Management's Discussion and Analysis (Continued)

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.

Management's Discussion and Analysis (Continued)
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.

Management's Discussion and Analysis (Continued)**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)
	<u>\$ 16,952</u>	<u>\$ 16,532</u>	<u>\$ 24,212</u>	<u>\$ 16,341</u>	<u>\$ 15,944</u>	<u>\$ 24,013</u>	<u>\$ (1,472)</u>	<u>\$ (1,109)</u>	<u>\$ (3,648)</u>

Management's Discussion and Analysis (Continued)
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)	

Management's Discussion and Analysis (Continued)

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.

Management's Discussion and Analysis (Continued)**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%.

Management's Discussion and Analysis (Continued)
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	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
	<u>\$ 326,052</u>	<u>\$ 252,911</u>

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
	<u>\$ 17,925</u>	<u>\$ 612</u>	<u>\$ 18,537</u>

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	<u>\$ 5,481</u>	<u>\$ 5,219</u>	<u>\$ 3,959</u>
Effective income tax rate	<u>24.4%</u>	<u>24.0%</u>	<u>37.4%</u>

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.

Management's Discussion and Analysis (Continued)

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.

Management's Discussion and Analysis (Continued)
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.

Management's Discussion and Analysis (Continued)**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)
	<u>\$ 3,126</u>	<u>\$ 2,901</u>	<u>\$ 2,311</u>

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.

Management's Discussion and Analysis (Continued)
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
	<u>\$ 142,675</u>	<u>\$ 140,809</u>	<u>\$ 134,639</u>			
Pre-tax earnings				12,365	12,308	10,927
Income taxes and noncontrolling interests				2,993	2,944	3,645
				<u>\$ 9,372</u>	<u>\$ 9,364</u>	<u>\$ 7,282</u>
Effective income tax rate				<u>23.7%</u>	<u>23.4%</u>	<u>32.8%</u>

* 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
	<u>\$ 62,730</u>	<u>\$ 61,883</u>	<u>\$ 57,645</u>	<u>\$ 9,522</u>	<u>\$ 9,366</u>	<u>\$ 8,324</u>

Management's Discussion and Analysis (Continued)

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.

Mammon'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. Mammon's business acquisitions included the acquisition of the Colson Medical companies on October 31, 2019, resulting in a new Medical sector. Mammon'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.

Mammon'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.

Management's Discussion and Analysis (Continued)

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.

Mammon'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.

Mammon'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.

Management's Discussion and Analysis (Continued)

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.

Management's Discussion and Analysis (Continued)

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
	<u>\$ 79,945</u>	<u>\$ 78,926</u>	<u>\$ 76,994</u>	<u>\$ 2,843</u>	<u>\$ 2,942</u>	<u>\$ 2,603</u>

Management's Discussion and Analysis (Continued)

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.

Management's Discussion and Analysis (Continued)

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.

Management's Discussion and Analysis (Continued)**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.

Management's Discussion and Analysis (Continued)**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 to 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.

Management's Discussion and Analysis (Continued)

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.

Management's Discussion and Analysis (Continued)

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.

Management's Discussion and Analysis (Continued)

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.

Management's Discussion and Analysis (Continued)

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 Bomhuetter-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.

Management's Discussion and Analysis (Continued)

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⁾
<i>December 31, 2019</i>				
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)
<i>December 31, 2018</i>				
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.

Management's Discussion and Analysis (Continued)
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)

Management's Discussion and Analysis (Continued)

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

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.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM (Continued)

- 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	2018
ASSETS		
<i>Insurance and Other:</i>		
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
	<u>630,572</u>	<u>532,307</u>
<i>Railroad, Utilities and Energy:</i>		
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
	<u>187,157</u>	<u>175,487</u>
	<u>\$ 817,729</u>	<u>\$ 707,794</u>

* 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	2018
LIABILITIES AND SHAREHOLDERS' EQUITY		
<i>Insurance and Other:</i>		
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
	<u>234,570</u>	<u>222,488</u>
<i>Railroad, Utilities and Energy:</i>		
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
	<u>87,797</u>	<u>81,431</u>
Income taxes, principally deferred	66,799	51,375
Total liabilities	<u>389,166</u>	<u>355,294</u>
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	<u>424,791</u>	<u>348,703</u>
Noncontrolling interests	3,772	3,797
Total shareholders' equity	<u>428,563</u>	<u>352,500</u>
	<u><u>\$ 817,729</u></u>	<u><u>\$ 707,794</u></u>

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:			
<i>Insurance and Other:</i>			
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
	<u>211,163</u>	<u>204,164</u>	<u>199,928</u>
<i>Railroad, Utilities and Energy:</i>			
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
	<u>43,453</u>	<u>43,673</u>	<u>40,005</u>
Total revenues	<u>254,616</u>	<u>247,837</u>	<u>239,933</u>
Investment and derivative contract gains (losses):			
Investment gains (losses)	71,123	(22,155)	1,410
Derivative contract gains (losses)	1,484	(300)	718
	<u>72,607</u>	<u>(22,455)</u>	<u>2,128</u>
Costs and expenses:			
<i>Insurance and Other:</i>			
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
	<u>192,064</u>	<u>184,815</u>	<u>189,949</u>
<i>Railroad, Utilities and Energy:</i>			
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
	<u>33,639</u>	<u>34,399</u>	<u>31,288</u>
Total costs and expenses	<u>225,703</u>	<u>219,214</u>	<u>221,237</u>
Earnings before income taxes and equity method earnings (losses)	<u>101,520</u>	<u>6,168</u>	<u>20,824</u>
Equity method earnings (losses)	1,176	(2,167)	3,014
Earnings before income taxes	<u>102,696</u>	<u>4,001</u>	<u>23,838</u>
Income tax expense (benefit)	20,904	(321)	(21,515)
Net earnings	<u>81,792</u>	<u>4,322</u>	<u>45,353</u>
Earnings attributable to noncontrolling interests	375	301	413
Net earnings attributable to Berkshire Hathaway shareholders	<u>\$ 81,417</u>	<u>\$ 4,021</u>	<u>\$ 44,940</u>
Net earnings per average equivalent Class A share	<u>\$ 49,828</u>	<u>\$ 2,446</u>	<u>\$ 27,326</u>
Net earnings per average equivalent Class B share*	<u>\$ 33.22</u>	<u>\$ 1.63</u>	<u>\$ 18.22</u>
Average equivalent Class A shares outstanding	<u>1,633,946</u>	<u>1,643,795</u>	<u>1,644,615</u>
Average equivalent Class B shares outstanding	<u>2,450,919,020</u>	<u>2,465,692,368</u>	<u>2,466,923,163</u>

* 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					Total
	Common stock and capital in excess of par value	Accumulated other comprehensive income	Retained earnings	Treasury stock	Non-controlling interests	
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
<i>* Cash and cash equivalents and restricted cash at end of year are comprised of the following:</i>			
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.

(1) Significant accounting policies and practices (Continued)

(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 depreciation 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.

Notes to Consolidated Financial Statements (Continued)

(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
<i>December 31, 2019</i>				
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
	<u>\$ 18,073</u>	<u>\$ 626</u>	<u>\$ (14)</u>	<u>\$ 18,685</u>
<i>December 31, 2018</i>				
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
	<u>\$ 19,427</u>	<u>\$ 546</u>	<u>\$ (75)</u>	<u>\$ 19,898</u>

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

Notes to Consolidated Financial Statements (Continued)

(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
<i>December 31, 2019 *</i>			
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
	<u>\$ 110,340</u>	<u>\$ 137,687</u>	<u>\$ 248,027</u>

* 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
<i>December 31, 2018 *</i>			
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
	<u>\$ 102,867</u>	<u>\$ 69,890</u>	<u>\$ 172,757</u>

* 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.

Notes to Consolidated Financial Statements (Continued)
(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)
	<u>71,166</u>	<u>(22,438)</u>	<u>1,318</u>
Fixed maturity securities:			
Gross realized gains	87	480	103
Gross realized losses	(25)	(227)	(22)
Other	(105)	30	11
	<u>\$ 71,123</u>	<u>\$ (22,155)</u>	<u>\$ 1,410</u>

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)
	<u>\$ 17,527</u>	<u>\$ 16,280</u>

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.

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,	
	2019	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)
	<u>\$ 32,418</u>	<u>\$ 31,564</u>

Receivables of our railroad and our utilities and energy businesses are comprised of the following (in millions).

	December 31,	
	2019	2018
Trade receivables	\$ 3,120	\$ 3,433
Other	388	362
Allowances for uncollectible accounts	(91)	(129)
	<u>\$ 3,417</u>	<u>\$ 3,666</u>

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	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
	<u>\$ 19,852</u>	<u>\$ 19,069</u>

(10) Property, plant and equipment

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

	December 31,	
	2019	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
	<u>42,210</u>	<u>39,827</u>
Accumulated depreciation	(20,772)	(19,199)
	<u>\$ 21,438</u>	<u>\$ 20,628</u>

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). 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	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
	<u>\$ 137,838</u>	<u>\$ 131,780</u>

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
	<u>\$ 7,566</u>	<u>\$ 7,284</u>	<u>\$ 6,968</u>

(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	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)
	<u>\$ 15,065</u>	<u>\$ 14,298</u>

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.

Notes to Consolidated Financial Statements (Continued)

(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	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	<u>\$ 81,882</u>	<u>\$ 81,025</u>

Notes to Consolidated Financial Statements (Continued)

(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
	<u>\$ 41,153</u>	<u>\$ 10,102</u>	<u>\$ 40,493</u>	<u>\$ 8,994</u>
Railroad, utilities and energy:				
Trademarks and trade names	\$ 212	\$ 26	\$ 216	\$ 23
Customer relationships	678	324	678	286
Other	113	58	117	53
	<u>\$ 1,003</u>	<u>\$ 408</u>	<u>\$ 1,011</u>	<u>\$ 362</u>

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.

Notes to Consolidated Financial Statements (Continued)

(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.

Notes to Consolidated Financial Statements (Continued)
(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

Incurred Losses and ALAE through December 31,					IBNR and Case Development Liabilities	Cumulative Number of Reported Claims (in thousands)
Accident Year	2018*		2019			
2018	\$	8,345	\$	8,274	\$ 34	8,612
2019				9,020	334	8,772
Incurred losses and ALAE			\$	17,294		

Cumulative Paid Losses and ALAE through December 31,			
Accident Year	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

Incurred Losses and ALAE through December 31,							Cumulative Number of Reported Claims
Accident Year	2015*	2016*	2017*	2018*	2019	IBNR and Case Development Liabilities	(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		

Cumulative Paid Losses and ALAE through December 31,						IBNR and Case Development Liabilities	Cumulative Number of Reported Claims (in thousands)
Accident Year	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, Bomhuetter-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 claimage, coverage and litigation experience.

Incurred Losses and ALAE through December 31,											IBNR and Case Development Liabilities	Cumulative Number of Reported Claims (in thousands)
Accident Year	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017*	2018*	2019		
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,											IBNR and Case Development Liabilities	Cumulative Number of Reported Claims (in thousands)
Accident Year	2010*	2011*	2012*	2013*	2014*	2015*	2016*	2017*	2018*	2019		
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.

Notes to Consolidated Financial Statements (Continued)
(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

Notes to Consolidated Financial Statements (Continued)
(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.

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

Notes to Consolidated Financial Statements (Continued)

(16) Retroactive reinsurance contracts (Continued)

Incurring 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	2018
<i>Insurance and other:</i>			
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.

Notes to Consolidated Financial Statements (Continued)

(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	2018
<i>Railroad, utilities and energy:</i>			
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
	<u>\$ 10,420</u>	<u>\$ 5,471</u>	<u>\$ 4,958</u>	<u>\$ 9,402</u>	<u>\$ 5,080</u>

(18) Income taxes

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

	December 31,	
	2019	2018
Currently payable	\$ 24	\$ 323
Deferred	65,823	50,503
Other	952	549
	<u>\$ 66,799</u>	<u>\$ 51,375</u>

Notes to Consolidated Financial Statements (Continued)
(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	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
	<u>74,849</u>	<u>59,400</u>
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)
	<u>(9,026)</u>	<u>(8,897)</u>
Net deferred tax liability	<u>\$ 65,823</u>	<u>\$ 50,503</u>

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
	<u>\$ 20,904</u>	<u>\$ (321)</u>	<u>\$ (21,515)</u>
Current	\$ 5,818	\$ 5,176	\$ 3,299
Deferred	15,086	(5,497)	(24,814)
	<u>\$ 20,904</u>	<u>\$ (321)</u>	<u>\$ (21,515)</u>

Notes to Consolidated Financial Statements (Continued)

(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.

Notes to Consolidated Financial Statements (Continued)
(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.

Notes to Consolidated Financial Statements (Continued)
(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)

Notes to Consolidated Financial Statements (Continued)

(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.

Notes to Consolidated Financial Statements (Continued)

(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.

Notes to Consolidated Financial Statements (Continued)
(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	<u>\$ 481</u>	<u>\$ (4,346)</u>	<u>\$ (1,369)</u>	<u>\$ (9)</u>	<u>\$ (5,243)</u>

(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

Notes to Consolidated Financial Statements (Continued)
(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
	<u>\$ 62,624</u>	<u>\$ 50,458</u>	<u>\$ 29,399</u>	<u>\$ 23,357</u>	<u>\$ 20,096</u>	<u>\$ 68,682</u>	<u>\$ 254,616</u>

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
	<u>\$ 61,770</u>	<u>\$ 49,987</u>	<u>\$ 28,849</u>	<u>\$ 23,703</u>	<u>\$ 19,970</u>	<u>\$ 63,558</u>	<u>\$ 247,837</u>

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:			Total
	Less than 12 months	Greater than 12 months		
Electricity and natural gas	\$ 871	\$ 5,136	\$	6,007
Other sales and service contracts	1,158	2,562		3,720

Notes to Consolidated Financial Statements (Continued)
(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	<u>\$ (68)</u>	<u>\$ 64</u>	<u>\$ 126</u>

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	<u>\$ 4,653</u>	<u>\$ 12,889</u>	<u>\$ 17,542</u>	<u>\$ 4,346</u>	<u>\$ 11,540</u>	<u>\$ 15,886</u>
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	<u>\$ 4,898</u>	<u>\$ 13,808</u>	<u>\$ 18,706</u>	<u>\$ 4,551</u>	<u>\$ 12,371</u>	<u>\$ 16,922</u>

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	<u>\$ 4,808</u>	<u>\$ 11,688</u>	<u>\$ 16,496</u>	<u>\$ 4,385</u>	<u>\$ 10,574</u>	<u>\$ 14,959</u>
Funded status – net liability	<u>\$ 90</u>	<u>\$ 2,120</u>	<u>\$ 2,210</u>	<u>\$ 166</u>	<u>\$ 1,797</u>	<u>\$ 1,963</u>

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.

Notes to Consolidated Financial Statements (Continued)
(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	
<i>December 31, 2019</i>					
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
	<u>\$ 16,496</u>	<u>\$ 11,905</u>	<u>\$ 2,001</u>	<u>\$ 480</u>	<u>\$ 2,110</u>
<i>December 31, 2018</i>					
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
	<u>\$ 14,959</u>	<u>\$ 10,692</u>	<u>\$ 1,899</u>	<u>\$ 456</u>	<u>\$ 1,912</u>

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	<u>\$ (1,896)</u>	<u>\$ (1,184)</u>

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.

Notes to Consolidated Financial Statements (Continued)**(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

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		
	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)
	<u>\$ 254,616</u>	<u>\$ 247,837</u>	<u>\$ 239,933</u>	<u>\$ 102,696</u>	<u>\$ 4,001</u>	<u>\$ 23,838</u>
	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)
	<u>\$ 3,961</u>	<u>\$ 3,853</u>	<u>\$ 4,386</u>	<u>\$ 20,904</u>	<u>\$ (321)</u>	<u>\$ (21,515)</u>

Notes to Consolidated Financial Statements (Continued)

(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
	<u>\$ 15,979</u>	<u>\$ 14,537</u>	<u>\$ 11,708</u>	<u>\$ 8,747</u>	<u>\$ 8,386</u>	<u>\$ 7,719</u>
	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
	<u>\$ 81,882</u>	<u>\$ 81,025</u>	<u>\$ 81,258</u>	<u>664,703</u>	<u>571,410</u>	<u>565,423</u>
Reconciliation to consolidated amount:						
Corporate and other				71,144	55,359	55,414
Goodwill				81,882	81,025	81,258
				<u>\$ 817,729</u>	<u>\$ 707,794</u>	<u>\$ 702,095</u>

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)
	<u>\$ 56,971</u>	<u>\$ 52,614</u>	<u>\$ 56,498</u>	<u>\$ 5,840</u>	<u>\$ 6,602</u>	<u>\$ 5,744</u>
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)
	<u>\$ 55,332</u>	<u>\$ 50,919</u>	<u>\$ 54,891</u>	<u>\$ 5,746</u>	<u>\$ 6,499</u>	<u>\$ 5,706</u>

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
	<u>\$ 56,971</u>	<u>\$ 52,614</u>	<u>\$ 56,498</u>	<u>\$ 5,840</u>	<u>\$ 6,602</u>	<u>\$ 5,744</u>

Notes to Consolidated Financial Statements (Continued)
(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:

	PAGE
<u>Report of Independent Registered Public Accounting Firm</u>	K-63
<u>Consolidated Balance Sheets—</u>	
<u>December 31, 2019 and December 31, 2018</u>	K-66
<u>Consolidated Statements of Earnings—</u>	
<u>Years Ended December 31, 2019, December 31, 2018, and December 31, 2017</u>	K-68
<u>Consolidated Statements of Comprehensive Income—</u>	
<u>Years Ended December 31, 2019, December 31, 2018, and December 31, 2017</u>	K-69
<u>Consolidated Statements of Changes in Shareholders' Equity—</u>	
<u>Years Ended December 31, 2019, December 31, 2018, and December 31, 2017</u>	K-69
<u>Consolidated Statements of Cash Flows—</u>	
<u>Years Ended December 31, 2019, December 31, 2018, and December 31, 2017</u>	K-70
<u>Notes to Consolidated Financial Statements</u>	K-71

2. Financial Statement Schedule

<u>Report of Independent Registered Public Accounting Firm</u>	K-113
<u>Schedule I—Parent Company Condensed Financial Information</u>	
<u>Balance Sheets as of December 31, 2019 and 2018, Statements of Earnings and Comprehensive Income</u>	
<u>and Cash Flows for the years ended December 31, 2019, December 31, 2018 and December 31, 2017</u>	
<u>and Note to Condensed Financial Information</u>	K-114

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
	<u>\$ 446,568</u>	<u>\$ 369,185</u>
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
	<u>21,777</u>	<u>20,482</u>
Berkshire Hathaway shareholders' equity	424,791	348,703
	<u>\$ 446,568</u>	<u>\$ 369,185</u>

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
	<u>80,840</u>	<u>5,706</u>	<u>43,199</u>
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
	<u>81,988</u>	<u>3,621</u>	<u>46,486</u>
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)
	<u>571</u>	<u>(400)</u>	<u>1,546</u>
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	<u>\$ 81,189</u>	<u>\$ 1,810</u>	<u>\$ 66,213</u>

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

BERKSHIRE HATHAWAY INC.
Subsidiaries of Registrant (1)
December 31, 2019

Company Name	Domicile or State of Incorporation
Acme Brick Company	Delaware
Acme Building Brands, Inc.	Delaware
Albecca Inc.	Georgia
AltaLink Holdings, L.P.	Canada
AltaLink Investments, L.P.	Canada
AltaLink, L.P.	Canada
Ben Bridge Corporation	Washington
Ben Bridge Jeweler, Inc.	Washington
Benjamin Moore & Co.	New Jersey
Benjamin Moore & Co., Limited	Canada
Benson Industries, Inc.	Oregon
Berkshire Hathaway Assurance Corporation	New York
Berkshire Hathaway Automotive Inc.	Delaware
Berkshire Hathaway Credit Corporation	Nebraska
Berkshire Hathaway Energy Company	Iowa
Berkshire Hathaway Finance Corporation	Delaware
Berkshire Hathaway Homestate Insurance Company	Nebraska
Berkshire Hathaway International Insurance Limited	United Kingdom
Berkshire Hathaway Life Insurance Company of Nebraska	Nebraska
Berkshire Hathaway Specialty Insurance Company	Nebraska
BH Finance LLC	Nebraska
BH Media Group, Inc.	Delaware
BH Shoe Holdings, Inc.	Delaware
BHE AltaLink Ltd.	Canada
BHE Canada Holdings Corporation	Canada
BHE Canada, LLC	Delaware
BHE Renewables, LLC	Delaware
BHE U.S. Transmission, LLC	Delaware
BHE Wind, LLC	Delaware
BHSF, Inc.	Delaware
BNSF Railway Company	Delaware
Boat America Corporation	Virginia
Borsheim Jewelry Company, Inc.	Nebraska
Brooks Sports, Inc.	Washington
Burlington Northern Santa Fe, LLC	Delaware
Business Wire, Inc.	Delaware
Campbell Hausfeld, LLC	Delaware
Cannon-Muskegon Corporation	Michigan
Carlton Forge Works	California
Central States Indemnity Co. of Omaha	Nebraska
Central States of Omaha Companies, Inc.	Nebraska
Cerro Flow Products LLC	Delaware
Cerro Wire LLC	Delaware
Charter Brokerage Holdings Corp.	Delaware
Charter Brokerage Holdings, LLC	Delaware
Charter Brokerage LLC	New York
Chemtool Incorporated	Delaware
Clayton Homes, Inc.	Delaware

BERKSHIRE HATHAWAY INC.
Subsidiaries of Registrant (1)
December 31, 2019

Company Name	Domicile or State of Incorporation
Clayton Properties Group II, Inc.	Colorado
Clayton Properties Group, Inc.	Tennessee
CMH Capital, Inc.	Delaware
CMH Homes, Inc.	Tennessee
CMH Manufacturing, Inc.	Tennessee
Colson Medical, LLC	Delaware
Columbia Insurance Company	Nebraska
Cornelius, Inc.	Minnesota
CORT Business Services Corporation	Delaware
CTB International Corp.	Indiana
Cubic Designs, Inc.	Wisconsin
Cypress Insurance Company	California
Designed Metal Connections, Inc.	Delaware
Detlev Louis Motorrad-Vertriebsgesellschaft GmbH	Germany
Duracell (China) Limited	China
Duracell Batteries BVBA	Belgium
Duracell International Operations Sàrl	Switzerland
Duracell Manufacturing LLC	Delaware
Duracell U.S. Holding LLC	Delaware
Duracell U.S. Operations, Inc.	Delaware
Ecowater Systems LLC	Delaware
Empire Distributors of North Carolina, Inc.	Georgia
Empire Distributors, Inc.	Georgia
EXSIF Worldwide, Inc.	Delaware
Faraday Underwriting Limited	United Kingdom
FlightSafety International Inc.	New York
FlightSafety Services Corporation	Delaware
Forest River Manufacturing, LLC	Indiana
Forest River, Inc.	Indiana
Freedom Warehouse Corp.	Nevada
Freo Group Pty Ltd	Australia
Fruit of the Loom, Inc.	Delaware
Garan, Incorporated	Delaware
GEICO Advantage Insurance Company	Nebraska
GEICO Casualty Company	Maryland
GEICO Choice Insurance Company	Nebraska
GEICO Corporation	Delaware
GEICO General Insurance Company	Maryland
GEICO Indemnity Company	Maryland
GEICO Secure Insurance Company	Nebraska
Gen Re Intermediaries Corporation	New York
General Re Corporation	Delaware
General Re Life Corporation	Connecticut
General Reinsurance Africa Ltd.	South Africa
General Reinsurance AG	Germany
General Reinsurance Australia Ltd	Australia
General Reinsurance Corporation	Delaware
General Reinsurance Life Australia Ltd.	Australia
General Star Indemnity Company	Delaware
General Star National Insurance Company	Delaware

BERKSHIRE HATHAWAY INC.
Subsidiaries of Registrant (1)
December 31, 2019

Company Name	Domicile or State of Incorporation
Genesis Insurance Company	Delaware
Global Cranes Pty Ltd	Australia
Government Employees Insurance Company	Maryland
GRD Holdings Corporation	Delaware
H. H. Brown Shoe Company, Inc.	Delaware
Helzberg's Diamond Shops, Inc.	Missouri
Henley Holdings, LLC	Delaware
Homemakers Plaza, Inc.	Iowa
HomeServices of America, Inc.	Delaware
Huntington Alloys Corporation	Delaware
IMC (Germany) Holdings GmbH	Germany
IMC International Metalworking Companies B.V.	Netherlands
Ingersoll Cutting Tool Company	Delaware
Ingersoll Werkzeuge GmbH	Germany
International Dairy Queen, Inc.	Delaware
Iscar Ltd.	Israel
Johns Manville	Delaware
Johns Manville Corporation	Delaware
Johns Manville Europe GmbH	Germany
Johns Manville GmbH	Germany
Johns Manville Slovakia, a.s.	Slovakia
Jordan's Furniture, Inc.	Massachusetts
Justin Brands, Inc.	Delaware
Kahn Ventures, Inc.	Georgia
Kern River Gas Transmission Company	Delaware
KR Holding, LLC	Delaware
L. A. Darling Company LLC	Delaware
Larson-Juhl US LLC	Georgia
Lipotec, S.A.	Spain
LiquidPower Specialty Products Inc.	Delaware
Lubrizol (Gibraltar) Limited Luxembourg SCS	Luxembourg
Lubrizol Additive (Zhuhai) Co., Ltd.	China
Lubrizol Advanced Materials Europe BVBA	Belgium
Lubrizol Advanced Materials International, LLC	Delaware
Lubrizol Advanced Materials, Inc.	Delaware
Lubrizol France SAS	France
Lubrizol Holdings France SAS	France
Lubrizol Holdings Netherlands B.V.	Netherlands
Lubrizol International, Inc.	Delaware
Lubrizol Luxembourg S.a.r.l.	Luxembourg
Lubrizol Overseas Trading Corporation	Delaware
Lubrizol Southeast Asia (Pte.) Ltd.	Singapore
M&M Manufacturing, Inc.	Delaware
Mammon Beverage Technologies, Inc.	Delaware
Mammon Crane Services, Inc.	Delaware
Mammon Distribution Services, Inc.	Delaware
Mammon Energy Services Company	Delaware
Mammon Engineered Components Company	Delaware
Mammon Food, Beverage & Water Technologies Company LLC	Delaware
Mammon Highway Technologies LLC	Delaware

BERKSHIRE HATHAWAY INC.
Subsidiaries of Registrant (1)
December 31, 2019

Company Name	Domicile or State of Incorporation
Mammon Holdings, Inc.	Delaware
Marmon Retail & Highway Technologies Company LLC	Delaware
Mammon Retail Technologies Company	Delaware
Marmon Transportation Services LLC	Delaware
Marmon Tubing, Fittings & Wire Products, Inc.	Delaware
Mammon Water, Inc.	Delaware
Marmon Wire & Cable, Inc.	Delaware
Mammon/Keystone LLC	Delaware
Marquis Jet Holdings, Inc.	Delaware
Marquis Jet Partners, Inc.	Delaware
McLane Company, Inc.	Texas
McLane Foodservice, Inc.	Texas
MedPro Group Inc	Indiana
Meyn Food Processing Technology B.V.	Netherlands
Meyn Holding B.V.	Netherlands
MHC Inc.	Iowa
MidAmerican Energy Company	Iowa
MidAmerican Funding, LLC	Iowa
MiTek Industries, Inc.	Delaware
MLMIC Insurance Company	New York
Mount Vernon Fire Insurance Company	Pennsylvania
Mouser Electronics, Inc.	Delaware
National Fire & Marine Insurance Company	Nebraska
National Indemnity Company	Nebraska
National Indemnity Company of Mid-America	Iowa
National Indemnity Company of the South	Iowa
National Liability & Fire Insurance Company	Connecticut
Nebraska Furniture Mart, Inc.	Nebraska
Nederlandse Reassurantie Groep N.V.	Netherlands
NetJets Aviation, Inc.	Delaware
NetJets Inc.	Delaware
NetJets Sales, Inc.	Delaware
Nevada Power Company	Nevada
NFM of Kansas, Inc.	Kansas
NNGC Acquisition, LLC	Delaware
Northern Electric plc.	United Kingdom
Northern Natural Gas Company	Delaware
Northern Powergrid (Northeast) Limited	United Kingdom
Northern Powergrid (Yorkshire) plc.	United Kingdom
Northern Powergrid Holdings Company	United Kingdom
Northern Powergrid Limited	United Kingdom
Northern Powergrid UK Holdings	United Kingdom
NV Energy, Inc.	Nevada
NVE Holdings, LLC	Delaware
Oak River Insurance Company	Nebraska
Old United Casualty Company	Kansas
Old United Life Insurance Company	Arizona
Oriental Trading Company, Inc.	Delaware
OTC Brands, Inc.	Delaware
OTC Worldwide Holdings, Inc.	Delaware

BERKSHIRE HATHAWAY INC.
Subsidiaries of Registrant (1)
December 31, 2019

Company Name	Domicile or State of Incorporation
PacifiCorp	Oregon
PCC Airfoils LLC	Ohio
PCC Structurals, Inc.	Oregon
PLICO, Inc.	Oklahoma
PPW Holdings LLC	Delaware
Precision Castparts Corp.	Oregon
Precision Steel Warehouse, Inc.	Illinois
Primus International Inc.	Washington
Princeton Insurance Company	New Jersey
Procor Limited	Canada
Procrane Holdings, Inc.	Delaware
Procrane Inc.	Canada
R. C. Willey Home Furnishings	Utah
Railsplitter Holdings Corporation	Delaware
Redwood Fire and Casualty Insurance Company	Nebraska
Richline Group, Inc.	Delaware
RSCC Wire & Cable LLC	Delaware
Russell Brands, LLC	Delaware
Sager Electrical Supply Co. Inc	Massachusetts
Schuller GmbH	Germany
Scott Fetzer Company	Delaware
Scott Fetzer Financial Group, Inc.	Delaware
See's Candies, Inc.	California
See's Candy Shops, Inc.	California
Shaw Contract Flooring Services, Inc.	Georgia
Shaw Industries Group, Inc.	Georgia
Shaw Industries, Inc.	Georgia
Sierra Pacific Power Company	Nevada
Söfft Shoe Company, LLC	Delaware
Special Metals Corporation	Delaware
SPS Technologies, LLC	Pennsylvania
Star Furniture Company	Texas
Sterling Crane LLC	Delaware
TaeguTec Ltd.	Korea
The Duracell Company	Delaware
The Fechheimer Brothers Company	Delaware
The Lubrizol Corporation	Ohio
The Marmon Group of Canada Ltd.	Canada
The Medical Protective Company	Indiana
The Pampered Chef, Ltd.	Illinois
Titanium Metals Corporation	Delaware
TTI, Inc.	Delaware
Tungaloy Corporation	Japan
U.S. Investment Corporation	Pennsylvania
U.S. Underwriters Insurance Company	North Dakota
Union Tank Car Company	Delaware
Union Underwear Company, Inc.	Delaware
United States Liability Insurance Company	Pennsylvania
UTLX Company	Delaware
Vanderbilt Mortgage and Finance, Inc.	Tennessee

BERKSHIRE HATHAWAY INC.
Subsidiaries of Registrant (1)
December 31, 2019

Company Name	Domicile or State of Incorporation
Vanity Fair Brands, LP	Delaware
Warwick International Group Limited	United Kingdom
Webb Wheel Products, Inc.	Delaware
Wells Lamont LLC	Delaware
WestGUARD Insurance Company	Pennsylvania
World Book/Scott Fetzer Company, Inc.	Nebraska
Worldwide Containers, Inc.	Delaware
WPLG, Inc.	Delaware
Wyman-Gordon Company	Massachusetts
Wyman-Gordon Forgings, Inc.	Delaware
XTRA Companies, Inc.	Delaware
XTRA Corporation	Delaware
XTRA Finance Corporation	Delaware
XTRA Lease LLC	Delaware
XTRA LLC	Maine
Yorkshire Electricity Group plc.	United Kingdom
Yorkshire Power Group Limited	United Kingdom
21st Mortgage Corporation	Delaware

- (1) Each of the named subsidiaries is not necessarily a “significant subsidiary” as defined in Rule 1-02(w) of Regulation S-X, and Berkshire has several additional subsidiaries not named above. The unnamed subsidiaries, considered in the aggregate as a single subsidiary, would not constitute a “significant subsidiary” at the end of the year covered by this report.

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in Registration Statement No. 333-229396 on Form S-3 and Registration Statement Nos. 333-225027, 333-224221, 333-215556, 333-53046, 333-64284, 333-70609, 333-74312, 333-75612, 333-101662, 333-164961, 333-164959, 333-164958, 333-111614, 333-179855, 333-194948, 333-203130, and 333-232424 on Form S-8 of our reports dated February 22, 2020, relating to the consolidated financial statements and financial statement schedule of Berkshire Hathaway Inc., and the effectiveness of Berkshire Hathaway Inc.'s internal control over financial reporting (which reports express an unqualified opinion and include an explanatory paragraph relating to the Company's change in 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"), appearing in the Annual Report on Form 10-K of Berkshire Hathaway Inc. for the year ended December 31, 2019.

/s/ Deloitte & Touche LLP

Omaha, Nebraska
February 22, 2020

FORM 10-K

Year ended December 31, 2019

Rule 13a-14(a)/15d-14(a) Certifications

CERTIFICATIONS

I, Warren E. Buffett, certify that:

1. I have reviewed this annual report on Form 10-K of Berkshire Hathaway Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;
 - c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 22, 2020

/s/ WARREN E. BUFFETT

 Chairman—Principal Executive Officer

FORM 10-K

Year ended December 31, 2019

Rule 13a-14(a)/15d-14(a) Certifications

CERTIFICATIONS

I, Marc D. Hamburg, certify that:

1. I have reviewed this annual report on Form 10-K of Berkshire Hathaway Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;
 - c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 22, 2020

/s/ MARC D. HAMBURG

Senior Vice President—Principal Financial Officer

FORM 10-K**Section 1350 Certifications****Year ended December 31, 2019**

I, Warren E. Buffett, Chairman and Chief Executive Officer of Berkshire Hathaway Inc. (the “Company”), certify, pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C. Section 1350, that to the best of my knowledge:

- (1) the Annual Report on Form 10-K of the Company for the period ended December 31, 2019 (the “Report”) fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m or 78o(d)); and
- (2) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: February 22, 2020

/s/ WARREN E. BUFFETT

Warren E. Buffett
Chairman and Chief Executive Officer

FORM 10-K**Section 1350 Certifications****Year ended December 31, 2019**

I, Marc D. Hamburg, Senior Vice President and Chief Financial Officer of Berkshire Hathaway Inc. (the “Company”), certify, pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C. Section 1350, that to the best of my knowledge:

- (1) the Annual Report on Form 10-K of the Company for the period ended December 31, 2019 (the “Report”) fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m or 78o(d)); and
- (2) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: February 22, 2020

/s/ MARC D. HAMBURG

Marc D. Hamburg
Senior Vice President and Chief Financial Officer

MINE SAFETY VIOLATIONS AND OTHER LEGAL MATTER DISCLOSURES
PURSUANT TO SECTION 1503(a) OF THE DODD-FRANK WALL STREET
REFORM AND CONSUMER PROTECTION ACT

PacifiCorp and its subsidiaries operate coal mines and coal processing facilities and Acme Brick and its affiliates operate clay, shale and limestone excavation facilities (collectively, the “mining facilities”) that are regulated by the Federal Mine Safety and Health Administration (“MSHA”) under the Federal Mine Safety and Health Act of 1977 (the “Mine Safety Act”). MSHA inspects mining facilities on a regular basis. The total number of reportable Mine Safety Act citations, orders, assessments and legal actions for the year ended December 31, 2019 are summarized in the table below and are subject to contest and appeal. The severity and assessment of penalties may be reduced or, in some cases, dismissed through the contest and appeal process. Amounts are reported regardless of whether PacifiCorp or Acme has challenged or appealed the matter. Mines that are closed or idled are not included in the information below if no reportable events occurred at those locations during the year ended December 31, 2019. PacifiCorp and Acme have not received any notice of a pattern, or notice of the potential to have a pattern, of violations of mandatory health or safety standards that are of such nature as could have significantly and substantially contributed to the cause and effect of coal or other mine health or safety hazards under Section 104(e) of the Mine Safety Act during the year ended December 31, 2019.

	Mine Safety Act					Total Value of Proposed MSHA Assessments (in thousands)	Total Number of Mining Related Fatalities	Legal Actions		
	Section 104 Significant and Substantial Citations (1)	Section 104(b) Orders (2)	Section 104(d) Citations/Orders (3)	Section 110(b)(2) Violations (4)	Section 107(a) Imminent Danger Orders (5)			Pending as of Last Day of Period (6)	Instituted During Period	Resolved During Period
Mining Facilities										
Coal:										
Bridger (surface)	—	—	—	—	—	\$	—	—	—	—
Bridger (underground)	5	—	2	—	—	43	—	1	3	4
Wyodak Coal Crushing Facility	—	—	—	—	—	—	—	—	—	—
Clay, shale and limestone:										
Malvern	—	—	—	—	—	—	—	—	—	—
Wheeler	—	—	—	—	—	—	—	—	—	—
Oklahoma City	2	—	—	—	—	(a)	—	—	—	—
Tulsa	—	—	—	—	—	—	—	—	—	—
Bennett	—	—	—	—	—	—	—	—	—	—
Denton	1	—	—	—	—	(a)	—	—	—	—
Elgin	—	—	—	—	—	—	—	—	—	—
Sealy	—	—	—	—	—	—	—	—	—	—
Texas Clay	—	—	—	—	—	—	—	—	—	—
Leeds	—	—	—	—	—	—	—	—	—	—
Montgomery	—	—	—	—	—	—	—	—	—	—
Cordova	—	—	—	—	—	—	—	—	—	—

(1) Citations for alleged violations of mandatory health and safety standards that could significantly or substantially contribute to the cause and effect of a safety or health hazard under Section 104 of the Mine Safety Act.

(2) For alleged failure to totally abate the subject matter of a Mine Safety Act Section 104(a) citation within the period specified in the citation.

(3) For alleged unwarrantable failure (i.e., aggravated conduct constituting more than ordinary negligence) to comply with a mandatory health or safety standard. Subsequently, MSHA modified the Section 104(d)(1) citation to a Section 104(a) citation and also vacated the Section 104(d)(1) order.

(4) For alleged flagrant violations (i.e., reckless or repeated failure to make reasonable efforts to eliminate a known violation of a mandatory health or safety standard that substantially and proximately caused, or reasonably could have been expected to cause, death or serious bodily injury).

(5) For the existence of any condition or practice in a coal or other mine which could reasonably be expected to cause death or serious physical harm before such condition or practice can be abated.

(6) Amounts include one contest of proposed penalties under Subpart C of the Federal Mine Safety and Health Review Commission's procedural rules. The pending legal actions are not exclusive to citations, notices, orders and penalties assessed by MSHA during the reporting period.

(a) Assessment was less than \$1,000.