J.P. Morgan Securities LLC and Subsidiaries

(An indirect wholly-owned subsidiary of JPMorgan Chase & Co.)

Consolidated Statement of Financial Condition
December 31, 2016

Table of Contents
December 31, 2016

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Report of Independent Registered Public Accounting Firm

To Management and the Board of Managers of
J.P. Morgan Securities LLC and Subsidiaries:

In our opinion, the accompanying consolidated statement of financial condition presents fairly, in all material respects, the financial position of J.P. Morgan Securities LLC and its subsidiaries (the "Company") as of December 31, 2016, in conformity with accounting principles generally accepted in the United States of America. The consolidated statement of financial condition is the responsibility of the Company's management. Our responsibility is to express an opinion on the consolidated statement of financial condition based on our audit. We conducted our audit of the consolidated statement of financial condition in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated statement of financial condition is free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the consolidated statement of financial condition, assessing the accounting principles used and significant estimates made by management, and evaluating the overall presentation of the consolidated statement of financial condition. We believe that our audit provides a reasonable basis for our opinion.

PricewaterhouseCoopers LLP

February 28, 2017

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Consolidated Statement of Financial Condition
December 31, 2016

(in millions)	
Assets	
Cash	$ 1,115
Cash and securities segregated under federal and other regulations	26,678
Securities purchased under resale agreements (included $16,157 at fair value)	117,276
Securities borrowed	72,755
Securities received as collateral, at fair value	7,845
Receivables from customers	16,419
Receivables from brokers, dealers, clearing organizations and others	17,689
Financial instruments owned, at fair value (included assets pledged of $72,812)	115,743
Goodwill	1,356
Other assets (included $16 at fair value)	2,479
Total assets[a]	**$ 379,355**
Liabilities	
Commercial paper	$ 11,738
Short-term borrowings (included $221 at fair value)	10,840
Securities sold under repurchase agreements (included $288 at fair value)	169,910
Securities loaned	14,648
Obligation to return securities received as collateral, at fair value	8,649
Payables to customers	88,911
Payables to brokers, dealers, clearing organizations and others	4,585
Financial instruments sold, not yet purchased, at fair value	27,844
Other liabilities and accrued expenses	2,829
Beneficial interests issued by consolidated variable interest entities (“VIE”) (included $72 at fair value)	277
Long-term debt (included $7,177 at fair value)	7,677
Total liabilities[a]	**347,908**
Commitments and contingencies (see Note 17)	
Subordinated liabilities	14,000
Member’s equity	
Member’s interest	6,167
Retained earnings	11,280
Total member’s equity	**17,447**
Total liabilities and member’s equity	**$ 379,355**

(a) The following table presents information on assets and liabilities related to VIEs that are consolidated by the Company at December 31, 2016. The difference between total VIE assets and liabilities represents the Company’s interests in those entities, which were eliminated in consolidation.

(in millions)	
Assets	
Financial instruments owned	$ 308
Total assets	**$ 308**
Liabilities	
Beneficial interests issued by consolidated VIEs	$ 277
Total liabilities	**$ 277**

The assets of consolidated VIEs are used to settle the liabilities of those entities. The holders of the beneficial interests do not have recourse to the general credit of the Company.

The accompanying notes are an integral part of this Consolidated Statement of Financial Condition.

1. Organization

The Consolidated Statement of Financial Condition includes the accounts of J.P. Morgan Securities LLC ("JPMorgan Securities") and its subsidiaries (collectively the "Company"). The Company is an indirect wholly-owned subsidiary of JPMorgan Chase & Co. ("JPMorgan Chase"), which is a leading global financial services firm and one of the largest banking institutions in the United States of America ("U.S."), with operations worldwide. For purposes of this report, an "affiliate" is defined as JPMorgan Chase or a direct or indirect subsidiary of JPMorgan Chase. The Company is a registered broker-dealer and investment adviser with the United States Securities and Exchange Commission ("SEC") and a futures commission merchant ("FCM") with the Commodities Futures Trading Commission ("CFTC"). The Company is provisionally registered with the National Futures Association ("NFA") as a swap dealer, and the Company is progressing toward final registration. The Company is also a member of the Securities Investor Protection Corporation ("SIPC"), the New York Stock Exchange ("NYSE") and other exchanges.

Nature of business

The Company acts as a primary dealer in U.S. government securities; makes markets in money market instruments and U.S. government agency securities; underwrites and trades various types of debt and equity securities (including securities issued by JPMorgan Chase or its affiliates); advises clients on business strategies, capital structures and financial strategies; structures derivative transactions to meet client needs; engages in the execution and clearance of exchange-traded futures and options, and clears over-the-counter ("OTC") derivative contracts in connection with JPMorgan Chase's and its affiliates' client-driven market-making and risk management activities. The Company provides securities clearing and customer financing, and enters into securities purchased under resale agreements ("resale agreements") and securities sold under repurchase agreements ("repurchase agreements"). The Company also enters into securities borrowed and loaned transactions to finance securities activities, including through JPMorgan Securities' wholly-owned subsidiary J.P. Morgan Prime Inc. ("JPMorgan Prime") for certain prime brokerage customer transactions. Additionally, the Company acts as a clearing broker carrying and clearing (i) customer cash and margin accounts for correspondents on either a fully disclosed or omnibus basis, and (ii) the proprietary trading accounts of hedge funds, brokers and dealers and other professional trading firms, collectively "clearing clients". The Company also acts as a carrying and clearing broker for certain activities of its affiliates on either a fully disclosed or omnibus basis.

Credit ratings

The credit ratings of the Company as of December 31, 2016, were as follows.

	Long-term issuer	Short-term issuer	Outlook
Moody's Investors Service ("Moody's")	Aa3[(a)]	P-1	Stable
Standard & Poor's (S&P)	A+	A-1	Stable
Fitch Ratings	AA-	F1+	Stable

(a) On February 22, 2017, Moody's published its updated rating methodologies for securities firms. Subsequently, as a result of this action, the Company's long-term issuer rating was downgraded by one notch from Aa3 to A1. The short-term issuer rating was unchanged and the outlook remained stable.

Merger of J. P. Morgan Securities LLC and J.P. Morgan Clearing Corp.

Effective October 1, 2016, JPMorgan Securities merged with J.P. Morgan Clearing Corp. ("Clearing Corp."). Prior to the merger, Clearing Corp. was a wholly-owned subsidiary of and consolidated by JPMorgan Securities. JPMorgan Securities is the surviving legal entity, and its name will remain unchanged. Clearing Corp.'s primary business activity was providing securities and futures clearing, customer financing, securities lending and related services. Following the merger, these services are performed by JPMorgan Securities.

2. Significant accounting policies

The accounting and financial reporting policies of the Company conform to accounting principles generally accepted in the U.S. ("U.S. GAAP"). Additionally, where applicable, the policies conform to the accounting and reporting guidelines prescribed by regulatory authorities.

(a) Accounting and reporting developments

Financial Accounting Standards Board ("FASB") Standards adopted during 2016

Standard	Summary of guidance	Effects on Consolidated Statement of Financial Condition
Amendments to the consolidation analysis	• Eliminates the deferral issued by the FASB in February 2010 of VIE-related accounting requirements for certain investment funds, including mutual funds, private equity funds and hedge funds. • Amends the evaluation of fees paid to a decision-maker or a service provider, and exempts certain money market funds from consolidation.	• Adopted January 1, 2016. • There was no material impact on the Company's Consolidated Statement of Financial Condition.
Improvements to employee share-based payment accounting	• Requires that all excess tax benefits and tax deficiencies that pertain to employee stock-based incentive payments be recognized within income tax expense in the Consolidated Statement of Income.	• Adopted January 1, 2016. • There was no material impact on the Company's Consolidated Statement of Financial Condition.
Measuring the financial assets and financial liabilities of a consolidated collateralized financing entity	• Provides an alternative for consolidated financing VIEs to elect: (1) to measure their financial assets and liabilities separately under existing U.S. GAAP for fair value measurement with any differences in such fair values reflected in earnings; or (2) to measure both their financial assets and liabilities using the more observable of the fair value of the financial assets or the fair value of the financial liabilities.	• Adopted January 1, 2016. • There was no material impact on the Company's Consolidated Statement of Financial Condition as the Company has historically measured the financial assets and liabilities using the more observable fair value.
Recognition and measurement of financial assets and financial liabilities - DVA to OCI	• For financial liabilities where the fair value option has been elected, the portion of the total change in fair value caused by changes in the Company's own credit risk (i.e., debit valuation adjustment ("DVA")) is required to be presented separately in other comprehensive income ("OCI"). • Requires a cumulative effect adjustment to retained earnings as of the beginning of the reporting period of adoption.	• Adopted January 1, 2016. • There was no material impact on the Company's Consolidated Statement of Financial Condition.

FASB Standards issued but not yet adopted

Standard	Summary of guidance	Effects on Consolidated Statement of Financial Condition
Revenue recognition – revenue from contracts with customers *Issued May 2014*	• Requires that revenue from contracts with customers be recognized upon transfer of control of a good or service in the amount of consideration expected to be received. • Changes the accounting for certain contract costs, including whether they may be offset against revenue in the Consolidated Statement of Income, and requires additional disclosures about revenue and contract costs. • May be adopted using a full retrospective approach or a modified, cumulative effect approach wherein the guidance is applied only to existing contracts as of the date of initial application, and to new contracts transacted after that date.	• Required effective date: January 1, 2018.[a] • Because the guidance does not apply to revenue associated with financial instruments, including loans and securities that are accounted for under other U.S. GAAP, the Company does not expect the new revenue recognition guidance to have a material impact on the elements of its Consolidated Statement of Income most closely associated with financial instruments, including securities gains, interest income and interest expense. • The Company plans to adopt the revenue recognition guidance in the first quarter of 2018. The Company's implementation efforts include the identification of revenue within the scope of the guidance, as well as the evaluation of revenue contracts and related accounting policies. While the Company has not yet identified any material changes in the timing of revenue recognition, the Company's review is ongoing, and it continues to evaluate the presentation of certain contract costs (whether presented gross or offset against noninterest revenue).

(a) Early adoption is permitted.

FASB Standards issued but not yet adopted (continued)

Standard	Summary of guidance	Effects on Consolidated Statement of Financial Condition
Recognition and measurement of financial assets and financial liabilities *Issued January 2016*	• Requires that certain equity instruments be measured at fair value, with changes in fair value recognized in earnings. • Generally requires a cumulative effect adjustment to retained earnings as of the beginning of the reporting period of adoption.	• Required effective date: January 1, 2018. • The Company is currently evaluating the potential impact on the Consolidated Statement of Financial Condition. The Company's implementation efforts include the identification of securities within the scope of the guidance, the evaluation of the measurement alternative available for equity securities without a readily determinable fair value, and the related impact to accounting policies, presentation, and disclosures.
Leases *Issued February 2016*	• Requires lessees to recognize all leases longer than twelve months on the Consolidated Statement of Financial Condition as lease liabilities with corresponding right-of-use assets. • Requires lessees and lessors to classify most leases using principles similar to existing lease accounting, but eliminates the “bright line” classification tests. • Expands qualitative and quantitative disclosures regarding leasing arrangements. • Requires adoption using a modified cumulative effect approach wherein the guidance is applied to all periods presented.	• Required effective date: January 1, 2019.[(a)] • The Company is currently evaluating the potential impact on the Consolidated Statement of Financial Condition by reviewing its existing lease contracts and service contracts that may include embedded leases. The Company does not expect material changes to the recognition of operating lease expense in its Consolidated Statement of Income.
Classification of certain cash receipts and cash payments on the Consolidated Statement of Cash Flows *Issued August 2016*	• Provides targeted amendments to the classification of certain cash flows, including treatment of cash payments for settlement of zero-coupon debt instruments and distributions received from equity method investments.	• Required effective date: January 1, 2018.[(a)] • The Company is currently evaluating the potential impact on the Consolidated Statement of Financial Condition.
Treatment of restricted cash on the Consolidated Statement of Cash Flows *Issued November 2016*	• Requires inclusion of restricted cash in the cash balances on the Consolidated Statement of Cash Flows. • Requires additional disclosures to supplement the Consolidated Statement of Cash Flows.	• Required effective date: January 1, 2018.[(a)] • The Company is currently evaluating the potential impact on the Consolidated Statement of Financial Condition.
Goodwill *Issued January 2017*	• Requires an impairment loss to be recognized when the estimated fair value of a reporting unit falls below its carrying value. • Eliminates the second condition in the current guidance that requires an impairment loss to be recognized only if the estimated implied fair value of the goodwill is below its carrying value.	• Required effective date: January 1, 2020.[(a)] • Based on current impairment test results, the Company does not expect a material effect on the Consolidated Statement of Financial Condition.

(a) Early adoption is permitted.

(b) Basis of presentation

Consolidation

The Consolidated Statement of Financial Condition includes the accounts of the Company and entities in which the Company has a controlling financial interest as of December 31, 2016. All material intercompany balances and transactions have been eliminated. The Company determines whether it has a controlling financial interest in an entity by first evaluating whether the entity is a voting interest entity or a variable interest entity (“VIE”).

Voting interest entities

Voting interest entities are entities that have sufficient equity and provide the equity investors voting rights that enable them to make significant decisions relating to the entity’s operations. For these types of entities, the Company’s determination of whether it has a controlling interest is primarily based on the amount of voting equity interests held. Entities in which the Company has a controlling financial interest, through ownership of the majority of the entities’ voting equity interests, or through other contractual rights that give the Company control, are consolidated by the Company. Investments in companies in which the Company has significant influence over operating and financing decisions (but does not own a majority of the voting equity interests) are accounted for (i) in accordance with the equity method of accounting (which requires the Company to recognize its proportionate share of the entity's net earnings), or (ii) at fair value if the fair value option was elected. At December 31, 2016, the Company did not have any equity method investments.

Variable interest entities

VIEs are entities that, by design, either (1) lack sufficient equity to permit the entity to finance its activities without additional subordinated financial support from other parties, or (2) have equity investors that do not have the ability to make significant decisions relating to the entity's operations through voting rights, or do not have the obligation to absorb the expected losses, or do not have the right to receive the residual returns of the entity.

The most common type of VIE is a special purpose entity ("SPE"). SPEs are commonly used in securitization transactions in order to isolate certain assets and distribute the cash flows from those assets to investors. The basic SPE structure involves a company selling assets to the SPE; the SPE funds the purchase of those assets by issuing securities to investors. The legal documents that govern the transaction specify how the cash earned on the assets must be allocated to the SPE's investors and other parties that have rights to those cash flows. SPEs are generally structured to insulate investors from claims on the SPE's assets by creditors of other entities, including the creditors of the seller of the assets.

The primary beneficiary of a VIE (i.e., the party that has a controlling financial interest) is required to consolidate the assets and liabilities of the VIE. The primary beneficiary is the party that has both (1) the power to direct the activities of the VIE that most significantly impact the VIE's economic performance; and (2) through its interests in the VIE, the obligation to absorb losses or the right to receive benefits from the VIE that could potentially be significant to the VIE.

To assess whether the Company has the power to direct the activities of a VIE that most significantly impact the VIE's economic performance, the Company considers all facts and circumstances, including its role in establishing the VIE and its ongoing rights and responsibilities. This assessment includes, first, identifying the activities that most significantly impact the VIE's economic performance; and second, identifying which party, if any, has power over those activities. In general, the parties that make the most significant decisions affecting the VIE (such as asset managers, collateral managers, servicers, owners of call options or liquidation rights over the VIE's assets) or have the right to unilaterally remove those decision-makers are deemed to have the power to direct the activities of a VIE.

To assess whether the Company has the obligation to absorb losses or the right to receive benefits that could potentially be significant to the VIE, the Company considers all of its economic interests, including debt and equity investments, derivatives or other arrangements deemed to be variable interests in the VIE. This assessment requires that the Company apply judgment in determining whether these interests, in the aggregate, are considered potentially significant to the VIE. Factors considered in assessing significance include: the design of the VIE, including its capitalization structure; subordination of interests; payment priority; relative share of interests held within the VIE's capital structure; and the reasons why the interests are held by the Company.

The Company performs ongoing reassessments of (1) whether any entities previously evaluated under the majority voting-interest framework have become VIEs, based on certain events, and therefore subject to the VIE consolidation framework; and (2) whether changes in the facts and circumstances regarding the Company's involvement with a VIE cause the Company's consolidation conclusion to change. For further discussion related to VIEs, see Note 13.

Assets held for clients in an agency or fiduciary capacity

Assets owned by customers, including those that collateralize margin or other similar transactions and are held for clients in an agency or fiduciary capacity by the Company, are not assets of the Company and are not included on the Consolidated Statement of Financial Condition.

Use of estimates in the preparation of the Consolidated Statement of Financial Condition

The preparation of the Consolidated Statement of Financial Condition requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosures of contingent assets and liabilities. Actual results could be different from these estimates. In the opinion of management, all normal, recurring adjustments have been included for a fair statement of the Consolidated Statement of Financial Condition.

Foreign currency translation

The Company revalues assets and liabilities denominated in non-U.S. currencies into U.S. dollars using applicable exchange rates.

Offsetting assets and liabilities

U.S. GAAP permits entities to present derivative receivables and derivative payables with the same counterparty and the related cash collateral receivables and payables on a net basis on the Consolidated Statement of Financial Condition when a legally enforceable master netting agreement exists. U.S. GAAP also permits resale and repurchase agreements to be presented net when specified conditions are met, including the existence of a legally enforceable master netting agreement. The Company has elected to net such balances when the specified conditions are met.

The Company uses master netting agreements to mitigate counterparty credit risk in certain transactions, including derivatives transactions, resale and repurchase agreements, and securities borrowed and loaned agreements. A master netting agreement is a single contract with a counterparty that permits multiple transactions governed by that contract to be terminated and settled through a single payment in a single currency in the event of a default (e.g., bankruptcy, failure to make a required payment or securities transfer or deliver collateral or margin when due after expiration of any grace period). Upon the exercise of termination rights by the non-defaulting party, (i) all transactions are terminated, (ii) all transactions are valued and the positive value or “in the money” transactions are netted against the negative value or “out of the money” transactions and (iii) the only remaining payment obligation is of one of the parties to pay the netted termination amount. Upon exercise of repurchase agreement and/or securities loaned default rights in general (i) all securities loaned transactions are terminated and accelerated, (ii) all values of securities or cash held or to be delivered are calculated, and all such sums are netted against each other and (iii) the only remaining payment obligation is of one of the parties to pay the netted termination amount.

Typical master netting agreements for these types of transactions also often contain a collateral/margin agreement that provides for a security interest in or title transfer of securities or cash collateral/margin to the party that has the right to demand margin (the “demanding party”). The collateral/margin agreement typically requires a party to transfer collateral/margin to the demanding party with a value equal to the amount of the margin deficit on a net basis across all transactions governed by the master netting agreement, less any threshold. The collateral/margin agreement grants to the demanding party, upon default by the counterparty, the right to set-off any amounts payable by the counterparty against any posted collateral or the cash equivalent of any posted collateral/margin. It also grants to the demanding party the right to liquidate collateral/margin and to apply the proceeds to an amount payable by the counterparty. For further discussion of the Company’s derivative instruments and securities financing activities see Notes 5 and 6, respectively.

(c) Cash and securities segregated under federal and other regulations

The Company is required by its primary regulators, including the SEC and CFTC, to segregate cash and securities to satisfy rules regarding the protection of assets of customers and proprietary accounts of broker-dealers. See Note 18 for further information.

(d) Financial instruments

Financial instruments owned and financial instruments sold, not yet purchased are accounted for at fair value. For further discussion related to the Company’s valuation methodologies under fair value measurement, see Note 3. Balances reflect the reduction of securities owned (long positions) by the amount of identical securities sold but not yet purchased (short positions) when the long and short positions have identical Committee on Uniform Security Identification Procedures numbers (“CUSIPs”).

(e) Securities transactions

Principal securities transactions in regular way trades are recorded on the trade date, the date on which an agreement is executed to purchase or sell a security. Principal securities transactions in non-regular way trades are recorded on the settlement date (the date on which the payment of funds and delivery of securities are to take place) with changes in value recorded on the Consolidated Statement of Financial Condition between trade and settlement dates. Payables to brokers, dealers, clearing organizations and others included $1.1 billion of net unsettled principal securities transactions.

(f) Customer transactions

Receivables from and payables to customers primarily include amounts arising from securities and margin transactions. These customer securities transactions are recorded on the Consolidated Statement of Financial Condition on a settlement date basis. In the event of fails to deliver or receive securities, the Company records corresponding receivables from customers or payables to customers, respectively.

The Company monitors the market value of collateral held to secure receivables from customers. It is the Company’s policy to request and obtain additional collateral when appropriate.

(g) Goodwill

Goodwill is recorded upon completion of a business combination as the difference between the purchase price and the fair value of the net assets acquired. Subsequent to initial recognition, goodwill is not amortized but is tested for impairment annually, or more often if events or circumstances, such as adverse changes in the business climate, indicate that there may be impairment.

Impairment testing

Goodwill impairment testing is performed in two steps. In the first step, the current fair value of the Company is compared with its carrying value, including goodwill. If the fair value is in excess of the carrying value (including goodwill), goodwill is considered not to be impaired. If the fair value is less than the carrying value (including goodwill), then a second step is performed. In the second step, the implied current fair value of goodwill is determined by comparing the fair value of the Company (as determined in step one) to the fair value of the net assets of the Company, as if the Company were being acquired in a business combination. The resulting implied current fair value of goodwill is then compared with the carrying value of the Company's goodwill. If the carrying value of the goodwill exceeds its implied current fair value, then an impairment charge is recognized for the excess. If the carrying value of goodwill is less than its implied current fair value, then no goodwill impairment is recognized. Goodwill was not impaired at December 31, 2016, nor was any goodwill written off due to impairment for the year ended December 31, 2016.

Declines in business performance, increases in equity capital requirements, as well as deterioration in economic or market conditions, adverse estimates of the impact of regulatory or legislative changes or increases in the estimated market cost of equity, could cause the estimated fair value of the Company or its associated goodwill to decline in the future, which could result in a material impairment charge to earnings in a future period related to some portion of the associated goodwill.

(h) Income taxes

The results of operations of the Company are included in the consolidated federal, New York State, New York City and other state income tax returns filed by JPMorgan Chase. Pursuant to a tax sharing agreement, JPMorgan Chase allocates to the Company its share of the consolidated income tax expense or benefit based upon statutory rates applied to the Company's earnings as if it were filing separate income tax returns. The Company uses the asset and liability method to provide for income taxes on all transactions recorded on the Consolidated Statement of Financial Condition. Valuation allowances are established when necessary to reduce deferred tax assets to an amount that, in the opinion of management, is more likely than not to be realized. State and local income taxes are provided on the Company's taxable income at the effective income tax rate applicable to the consolidated JPMorgan Chase entity.

The guidance on accounting for uncertainty in income taxes describes how uncertain tax positions should be recognized, measured, presented and disclosed on the Consolidated Statement of Financial Condition. This guidance requires the evaluation of tax positions taken or expected to be taken in the course of preparing the Company's Consolidated Statement of Financial Condition to determine whether the tax positions are more likely than not to be realized as a tax benefit or expense in the current year. After-tax interest and penalties, as well as the related unrecognized tax benefits, are recognized in income tax expense.

The tax sharing agreement between JPMorgan Chase and the Company allows for intercompany payments to or from JPMorgan Chase for outstanding current tax assets or liabilities.

For further discussion of income taxes, see Note 7.

3. Fair value measurement of financial instruments

The Company carries a portion of its assets and liabilities at fair value. These assets and liabilities are carried at fair value on a recurring basis (i.e., assets and liabilities that are measured and reported at fair value on the Company's Consolidated Statement of Financial Condition).

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value is based on quoted market prices or inputs, where available. If prices or quotes are not available, fair value is based on models that consider relevant transaction characteristics (such as maturity) and use as inputs observable or unobservable market parameters, including but not limited to yield curves, interest rates, volatilities, equity or debt prices, foreign exchange rates and credit curves. Valuation adjustments may be made to ensure that financial instruments are recorded at fair value, as described below.

The level of precision in estimating unobservable market inputs or other factors can affect the amount of gain or loss recorded for a particular position. Furthermore, while the Company believes its valuation methods are appropriate and consistent with those of other market participants, the methods and assumptions used reflect management judgment and may vary across the Company's businesses and portfolios.

The Company uses various methodologies and assumptions in the determination of fair value. The use of different methodologies or assumptions by other market participants compared with those used by the Company could result in a different estimate of fair value at the reporting date.

Valuation process

Risk-taking functions are responsible for providing fair value estimates for assets and liabilities carried on the Consolidated Statement of Financial Condition at fair value. JPMorgan Chase's Valuation Control Group ("VCG"), which is part of JPMorgan Chase's Finance function and independent of the risk-taking functions, is responsible for verifying these estimates and determining any fair value adjustments that may be required to ensure that the Company's positions are recorded at fair value. In addition, JPMorgan Chase's Firmwide Valuation Governance Forum ("VGF") is composed of senior finance and risk executives and is responsible for overseeing the management of risks arising from valuation activities conducted across JPMorgan Chase. The VGF is chaired by the JPMorgan Chase firmwide head of the VCG (under the direction of JPMorgan Chase's Controller), and includes sub-forums covering its lines of business and the Company.

Price verification process

The VCG verifies fair value estimates provided by the risk-taking functions by leveraging independently derived prices, valuation inputs and other market data, where available. Where independent prices or inputs are not available, additional review is performed by the VCG to ensure the reasonableness of estimates, and may include: evaluating the limited market activity including client unwinds; benchmarking of valuation inputs to those for similar instruments; decomposing the valuation of structured instruments into individual components; comparing expected to actual cash flows; reviewing profit and loss trends; and reviewing trends in collateral valuation. There are also additional levels of management review for more significant or complex positions.

The VCG determines any valuation adjustments that may be required to the estimates provided by the risk-taking functions. No adjustments are applied for instruments classified within level 1 of the fair value hierarchy (see below for further information on the fair value hierarchy). For other positions, judgment is required to assess the need for valuation adjustments to appropriately reflect liquidity considerations, unobservable parameters and, for certain portfolios that meet specified criteria, the size of the net open risk position. The determination of such adjustments follows a consistent framework across JPMorgan Chase.

Liquidity valuation adjustments

Liquidity valuation adjustments are considered where an observable external price or valuation parameter exists but is of lower reliability, potentially due to lower market activity. Liquidity valuation adjustments are applied and determined based on current market conditions. Factors that may be considered in determining the liquidity adjustment include analysis of: (1) the estimated bid-offer spread for the instrument being traded; (2) alternative pricing points for similar instruments in active markets; and (3) the range of reasonable values that the price or parameter could take.

The Company manages certain portfolios of financial instruments on the basis of net open risk exposure and, as permitted by U.S. GAAP, has elected to estimate the fair value of such portfolios on the basis of a transfer of the entire net open risk position in an orderly transaction. Where this is the case, valuation adjustments may be necessary to reflect the cost of exiting a larger-than-normal market-size net open risk position. Where applied, such adjustments are based on factors that a relevant market participant would consider in the transfer of the net open risk position including the size of the adverse market move that is likely to occur during the period required to reduce the net open risk position to a normal market-size.

Unobservable parameter valuation adjustments may be made when positions are valued using prices or input parameters to valuation models that are unobservable due to a lack of market activity or because they cannot be implied from observable market data. Such prices or parameters must be estimated and are, therefore, subject to management judgment. Unobservable parameter valuation adjustments are applied to reflect the uncertainty inherent in the resulting valuation estimate.

Where appropriate, the Company also applies adjustments to its estimates of fair value in order to appropriately reflect counterparty credit quality, the Company's own creditworthiness and the impact of funding, applying a consistent framework across the Company.

Valuation model review and approval

If prices or quotes are not available for an instrument or a similar instrument, fair value is generally determined using valuation models that consider relevant transaction data such as maturity and use as inputs market-based or independently sourced parameters. Where this is the case the price verification process described above is applied to the inputs to those models.

The Model Risk function reviews and approves a wide range of models, including risk management, valuation and regulatory capital models used by the Company. The Model Risk function is independent of model users and developers. JPMorgan Chase's Firmwide Model Risk Executive reports to JPMorgan Chase's Chief Risk Officer ("CRO"). When reviewing a model, the Model Risk function analyzes and challenges the model methodology, and the reasonableness of model assumptions and may perform or require additional testing, including back-testing of model outcomes.

The Model Risk function reviews and approves new models, as well as material changes to existing models, prior to implementation in the operating environment. In certain circumstances, the head of the Model Risk function may grant exceptions to the Company's model risk policy to allow a model to be used prior to review or approval. The Model Risk function may also require the user to take appropriate actions to mitigate the model risk if it is to be used in the interim.

Valuation hierarchy

A three-level valuation hierarchy has been established under U.S. GAAP for disclosure of fair value measurements. The valuation hierarchy is based on the transparency of inputs to the valuation of an asset or liability as of the measurement date. The three levels are defined as follows.

- Level 1 – inputs to the valuation methodology are quoted prices (unadjusted) for identical assets or liabilities in active markets.
- Level 2 – inputs to the valuation methodology include quoted prices for similar assets and liabilities in active markets, and inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the financial instrument.
- Level 3 – one or more inputs to the valuation methodology are unobservable and significant to the fair value measurement.

A financial instrument's categorization within the valuation hierarchy is based on the lowest level of input that is significant to the fair value measurement.

The following is a description of the valuation methodologies generally used by the Company to measure its more significant products/instruments at fair value, including the general classification of such instruments pursuant to the valuation hierarchy.

Product/instrument	Valuation methodology	Classifications in the valuation hierarchy
Securities financing agreements	Valuations are based on discounted cash flows, which consider: • Derivative features: for further information refer to the discussion of derivatives below. • Market rates for the respective maturity • Collateral	Predominantly level 2
Financial instruments	Quoted market prices for securities are used where available.	Level 1
	In the absence of quoted market prices, financial instruments are valued based on: • Observable market prices for similar securities (excludes loans) • Observable market prices for loans (circumstances are infrequent) • Relevant broker quotes In addition, the following inputs to discounted cash flows are used for the following products: *Mortgage- and asset-backed securities specific inputs:* • Collateral characteristics • Deal-specific payment and loss allocations • Current market assumptions related to yield, prepayment speed, conditional default rates and loss severity *Collateralized loan obligations ("CLOs") specific inputs:* • Collateral characteristics • Deal-specific payment and loss allocations • Expected prepayment speed, conditional default rates, loss severity • Credit spreads • Credit rating data	Level 2 or 3

Product/instrument	Valuation methodology	Classifications in the valuation hierarchy
Derivatives	Exchange-traded derivatives that are actively traded and valued using the exchange price.	Level 1
	Derivatives that are valued using models such as the Black-Scholes option pricing model, simulation models, or a combination of models, that use observable or unobservable valuation inputs (e.g., plain vanilla options and interest rate and credit default swaps). Inputs include: • Contractual terms including the period to maturity • Readily observable parameters including interest rates and volatility • Credit quality of the counterparty and of the Company • Market funding levels • Correlation levels In addition, specific inputs used for derivatives valued based on models with significant unobservable inputs are as follows: *Certain long-dated equity option specific inputs include:* • Long-dated equity volatilities *Certain interest rate specific inputs include:* • Interest rate correlation • Interest rate spread volatility • Parameters describing the evolution of underlying interest rates	Level 2 or 3
Private equity direct investments	*Private equity direct investments* Fair value is estimated using all available information and considering the range of potential inputs, including: • Transaction prices • Trading multiples of comparable public companies • Operating performance of the underlying portfolio company • Adjustments as required, since comparable public companies are not identical to the company being valued, and for company-specific issues and lack of liquidity • Additional available inputs relevant to the investment	Level 2 or 3
Beneficial interests issued by consolidated VIEs	Valued using observable market information, where available In the absence of observable market information, valuations are based on the fair value of the underlying assets held by the VIE	Level 2 or 3
Structured notes (included in short-term borrowings and long-term debt)	• Valuations are based on discounted cash flow analyses that consider the embedded derivative and the terms and payment structure of the note • The embedded derivative features are considered using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that use observable or unobservable valuation inputs, depending on the embedded derivative. The specific inputs used vary according to the nature of the embedded derivative features, as described in the discussion above regarding derivative valuation	Level 2 or 3

The following table presents the assets and liabilities measured at fair value as of December 31, 2016, by major product category and fair value hierarchy.

Assets and liabilities measured at fair value on a recurring basis (in millions)	Fair value hierarchy Level 1	Level 2	Level 3	Derivative netting adjustments	Total fair value
Securities purchased under resale agreements	$ –	$ 16,157	$ –	$ –	$ 16,157
Securities received as collateral	7,845	–	–	–	7,845
Financial instruments owned:					
Mortgage-backed securities:					
U.S. government agencies - mortgage-backed securities[a]	13	40,512	22	–	40,547
Nonagency - mortgage-backed securities	–	1,968	82	–	2,050
Total - mortgage-backed securities	**13**	**42,480**	**104**	**–**	**42,597**
U.S. Treasury, government agencies and non-U.S. government securities[a]	14,687	5,149	–	–	19,836
Corporate debt securities	–	8,600	124	–	8,724
Equity securities	32,533	160	112	–	32,805
Loans	–	102	–	–	102
Certificates of deposit, bankers' acceptances and commercial paper	–	1,221	4	–	1,225
U.S. state and municipal obligations	–	3,935	–	–	3,935
Asset-backed securities	–	4,555	232	–	4,787
Other	–	313	324	–	637
Total debt and equity instruments[b]	**47,233**	**66,515**	**900**	**–**	**114,648**
Derivative receivables:					
Interest rate	436	3,301	2	(3,294)	445
Credit	–	713	–	(653)	60
Foreign exchange	–	102	–	(81)	21
Equity[c]	3	19,378	1,440	(20,252)	569
Total derivative receivables[d]	**439**	**23,494**	**1,442**	**(24,280)**	**1,095**
Total financial instruments owned	**47,672**	**90,009**	**2,342**	**(24,280)**	**115,743**
Other assets[e]	–	–	16	–	16
Total assets at fair value	**$ 55,517**	**$ 106,166**	**$ 2,358**	**$ (24,280)**	**$ 139,761**
Short-term borrowings	$ –	$ 113	$ 108	$ –	$ 221
Securities sold under repurchase agreements	–	288	–	–	288
Obligation to return securities received as collateral	8,649	–	–	–	8,649
Financial instruments sold, not yet purchased:					
Debt and equity instruments[b]	20,427	6,473	7	–	26,907
Derivative payables:					
Interest rate	361	2,934	54	(2,969)	380
Credit	–	549	–	(436)	113
Foreign exchange	–	126	–	(61)	65
Equity[c]	5	18,487	2,215	(20,328)	379
Total derivative payables[d]	**366**	**22,096**	**2,269**	**(23,794)**	**937**
Total financial instruments sold, not yet purchased	**20,793**	**28,569**	**2,276**	**(23,794)**	**27,844**
Beneficial interests issued by consolidated VIEs	–	72	–	–	72
Long-term debt	–	4,497	2,680	–	7,177
Total liabilities at fair value	**$ 29,442**	**$ 33,539**	**$ 5,064**	**$ (23,794)**	**$ 44,251**

(a) At December 31, 2016, included total U.S. government-sponsored enterprise obligations of $34.0 billion, which was predominantly mortgage-related.
(b) Balances reflect the reduction of financial instruments owned (long positions) by the amount of financials instruments sold, not yet purchased (short positions) when the long and short positions have identical CUSIPs.
(c) Equity derivative receivables and payables in level 3 primarily relate to positions with affiliates.
(d) As permitted under U.S. GAAP, the Company can net derivative receivables and derivative payables and the related cash collateral received and paid when a legally enforceable master netting agreement exists. For purposes of the table above, the Company does not reduce derivative receivables and derivative payables balances for this netting adjustment, either within or across the levels of the fair value hierarchy, as such netting is not relevant to a presentation based on the transparency of inputs to the valuation of an asset or liability. See Note 5 for further information.
(e) Represents private equity investments.

Transfers between levels for instruments carried at fair value on a recurring basis
For the year ended December 31, 2016, there were no significant transfers between levels 1 and 2.

During the year ended December 31, 2016, transfers from level 3 to level 2 included the following:

- $297 million of nonagency - commercial mortgage-backed securities driven by greater price transparency as a result of improved vendor pricing quality.
- $821 million of asset-backed securities, specifically student loan auction rate securities, driven by greater price transparency.
- $662 million of equity derivative receivables and $559 million of equity derivative payables, primarily with affiliates, driven by an increase in observability and a reduction of the significance in the unobservable inputs.

During the year ended December 31, 2016, transfers from level 2 to level 3 included the following:

- $286 million of asset-backed securities, specifically student loan senior bonds, driven by a decrease in observability and price transparency.
- $346 million of equity derivative receivables and $230 million of equity derivative payables, primarily with affiliates, driven by a decrease in observability and an increase in the significance in the unobservable inputs.

All transfers are assumed to occur at the beginning of the quarterly period in which they occur.

Level 3 valuation
Estimating fair value requires the application of judgment. The type and level of judgment required is largely dependent on the amount of observable market information available to the Company. For instruments valued using internally developed models that use significant unobservable inputs and are therefore classified within level 3 of the fair value hierarchy, judgments used to estimate fair value are more significant than those required when estimating the fair value of instruments classified within levels 1 and 2.

In arriving at an estimate of fair value for an instrument within level 3, management must first determine the appropriate model to use. Second, due to the lack of observability of significant inputs, management must assess all relevant empirical data in deriving valuation inputs including, but not limited to, transaction details, yield curves, interest rates, prepayment speed, default rates, volatilities, correlations, equity or debt prices, valuations of comparable instruments, foreign exchange rates and credit curves.

The following table presents the Company's primary level 3 financial instruments, the valuation techniques used to measure the fair value of those financial instruments, the significant unobservable inputs, the range of values for those inputs and, for certain instruments, the weighted averages of such inputs. While the determination to classify an instrument within level 3 is based on the significance of the unobservable inputs to the overall fair value measurement, level 3 financial instruments typically include observable components (that is, components that are actively quoted and can be validated to external sources) in addition to the unobservable components. The level 1 and/or level 2 inputs are not included in the table. In addition, the Company manages the risk of the observable components of level 3 financial instruments using securities and derivative positions that are classified within levels 1 or 2 of the fair value hierarchy.

The range of values presented in the table is representative of the highest and lowest level input used to value the significant groups of instruments within a product/instrument classification. Where provided, the weighted averages of the input values presented in the table are calculated based on the fair value of the instruments that the input is being used to value.

In the Company's view, the input range and the weighted average value do not reflect the degree of input uncertainty or an assessment of the reasonableness of the company's estimates and assumptions. Rather, they reflect the characteristics of the various instruments held by the Company and the relative distribution of instruments within the range of characteristics. For example, two option contracts may have similar levels of market risk exposure and valuation uncertainty, but may have significantly different implied volatility levels because the option contracts have different underlyings, tenors, or strike prices. The input range and weighted average values will therefore vary from period-to-period and parameter-to-parameter based on characteristics of the instruments held by the Company at each date of the Consolidated Statement of Financial Condition.

For the Company's derivatives and structured notes positions classified within level 3 at December 31, 2016, interest rate correlation inputs used in estimating fair value were concentrated towards the upper end of the range presented and equity correlation inputs were concentrated at the upper end of the range. In addition, the interest rate volatility inputs used in estimating fair value were distributed across the range presented. The equity volatilities are concentrated in the lower half end of the range.

Level 3 inputs[(a)]

December 31, 2016 (in millions, except for ratios)

Product/instrument	Fair value	Principal valuation technique	Unobservable inputs	Range of input values			Weighted average
Residential mortgage-backed securities and loans	$ 71	Discounted cash flows	Yield	4%	–	7%	6%
			Prepayment speed	2%	–	13%	8%
			Conditional default rate	1%	–	22%	7%
			Loss severity	30%	–	90%	70%
Commercial mortgage-backed securities and loans	10	Discounted cash flows	Yield	7%	–	25%	14%
			Conditional default rate	0%	–	100%	46%
			Loss severity		40%		40%
Corporate debt securities and other	707	Discounted cash flows	Yield	1%	–	17%	11%
Collateralized loan obligations	112	Market comparables	Price	$1	–	$111	$75
Net interest rate derivatives	(52)	Option pricing	Interest rate correlation		(12)%		
			Interest rate spread volatility	3%	–	38%	
Net equity derivatives	(775)	Option pricing	Equity volatility	20%	–	60%	
Long-term debt and short-term borrowings[(b)]	$ 2,788	Option pricing	Equity correlation	(50)%	–	80%	

(a) The categories presented in the table have been aggregated based upon the product type, which may differ from their classification on the Consolidated Statement of Financial Condition. Furthermore, the inputs presented for each valuation technique in the table are in some cases not applicable to every instrument valued using the technique as the characteristics of the instruments can differ.
(b) Long-term debt and short-term borrowings include fully-funded derivatives issued by affiliates of the Company that are predominantly financial instruments containing embedded derivatives. The estimation of the fair value of fully-funded derivatives is predominantly based on the derivative features embedded within the instruments. The significant unobservable inputs are broadly consistent with those presented for derivative payables.

Changes in and ranges of unobservable inputs

The following discussion provides a description of the impact on a fair value measurement of a change in each unobservable input in isolation, and the interrelationship between unobservable inputs, where relevant and significant. The impact of changes in inputs may not be independent as a change in one unobservable input may give rise to a change in another unobservable input, and where relationships exist between two unobservable inputs, those relationships are discussed below. Relationships may also exist between observable and unobservable inputs (for example, as observable interest rates rise, unobservable prepayment rates decline). Such relationships have not been included in the discussion below. In addition, for each of the individual relationships described below, the inverse relationship would also generally apply.

In addition, the following discussion provides a description of attributes of the underlying instruments and external market factors that affect the range of the inputs used in the valuation of the Company's positions.

Yield – The yield of an asset is the interest rate used to discount future cash flows in a discounted cash flow calculation. An increase in the yield, in isolation, would result in a decrease in a fair value measurement.

Credit spread – The credit spread is the amount of additional annualized return over the market interest rate that a market participant would demand for taking exposure to the credit risk of an instrument. The credit spread for an instrument forms part of the discount rate used in a discounted cash flow calculation. Generally, an increase in the credit spread would result in a decrease in a fair value measurement.

The yield and the credit spread of a particular mortgage-backed security primarily reflect the risk inherent in the instrument. The yield is also impacted by the absolute level of the coupon paid by the instrument (which may not correspond directly to the level of inherent risk). Therefore, the range of yield and credit spreads reflects the range of risk inherent in various instruments owned by the Company. The risk inherent in mortgage-backed securities is driven by the subordination of the security being valued and the characteristics of the underlying mortgages within the collateralized pool, including borrower FICO scores, loan-to-value ("LTV") ratios for residential mortgages and the nature of the property and/or any tenants for commercial mortgages. For corporate debt securities and other similar instruments, credit spreads reflect the credit quality of the obligor and the tenor of the obligation.

Prepayment speed - The prepayment speed is a measure of the voluntary unscheduled principal repayments of a prepayable obligation in a collateralized pool. Prepayment speeds generally decline as borrower delinquencies rise. An increase in prepayment speeds, in isolation, would result in a decrease in a fair value measurement of assets valued at a premium to par and an increase in a fair value measurement of assets valued at a discount to par.

Prepayment speeds may vary from collateral pool to collateral pool, and are driven by the type and location of the underlying borrower, the remaining tenor of the obligation as well as the level and type (e.g., fixed or floating) of interest rate being paid by the borrower. Typically collateral pools with higher borrower credit quality have a higher prepayment rate than those with lower borrower credit quality, all other factors being equal.

Conditional default rate – The conditional default rate is a measure of the reduction in the outstanding collateral balance underlying a collateralized obligation as a result of defaults. While there is typically no direct relationship between conditional default rates and prepayment speeds, collateralized obligations for which the underlying collateral have high prepayment speeds will tend to have lower conditional default rates. An increase in conditional default rates would generally be accompanied by an increase in loss severity and an increase in credit spreads. An increase in the conditional default rate, in isolation, would result in a decrease in a fair value measurement. Conditional default rates reflect the quality of the collateral underlying a securitization and the structure of the securitization itself. Based on the types of securities owned in the Company's market-making portfolios, conditional default rates are most typically at the lower end of the range presented.

Loss severity – The loss severity (the inverse of which is termed the recovery rate) is the expected amount of future realized losses resulting from the ultimate liquidation of a particular loan, expressed as the net amount of loss relative to the outstanding loan balance. An increase in loss severity is generally accompanied by an increase in conditional default rates. An increase in the loss severity, in isolation, would result in a decrease in a fair value measurement. The loss severity applied in valuing a mortgage-backed security investment depends on a host of factors relating to the underlying mortgages. This includes the LTV, the nature of the lender's lien on the property and various other instrument-specific factors.

Correlation – Correlation is a measure of the relationship between the movements of the two variables (e.g., how the change in one variable influences the change in the other). Correlation is a pricing input for a derivative product where the payoff is driven by one or more underlying risks. Correlation inputs are related to the type of derivative (e.g., interest rate, credit, equity and foreign exchange) due to the nature of the underlying risks. When parameters are positively correlated, an increase in one parameter will result in an increase in the other parameter. When parameters are negatively correlated, an increase in one parameter will result in a decrease in the other parameter. An increase in correlation can result in an increase or a decrease in a fair value measurement. Given a short correlation position, an increase in correlation, in isolation, would generally result in a decrease in a fair value measurement. The range of correlation inputs between risks within the same asset class are generally narrower than those between underlying risks across asset classes. In addition, the ranges of credit correlation inputs tend to be narrower than those affecting other asset classes.

The level of correlation used in the valuation of derivatives with multiple underlying risks depends on a number of factors including the nature of those risks. For example, the correlation between two credit risk exposures would be different than that between two interest rate risk exposures. Similarly, the tenor of the transaction may also impact the correlation input as the relationship between the underlying risks may be different over different time periods. Furthermore, correlation levels are very much dependent on market conditions and could have a relatively wide range of levels within or across asset classes over time, particularly in volatile market conditions.

Volatility – Volatility is a measure of the variability in possible returns for an instrument, parameter or market index given how much the particular instrument, parameter or index changes in value over time. Volatility is a pricing input for options, including equity options. Generally, the higher the volatility of the underlying, the riskier the instrument. Given a long position in an option, an increase in volatility, in isolation, would generally result in an increase in a fair value measurement.

The level of volatility used in the valuation of a particular option-based derivative depends on a number of factors, including the nature of the risk underlying the option, the tenor of the derivative as well as the strike price of the option.

Additional disclosures about the fair value of financial instruments that are not carried at fair value on the Consolidated Statement of Financial Condition

U.S. GAAP requires disclosure of the estimated fair value of certain financial instruments, and the methods and significant assumptions used to estimate their fair values. Financial instruments within the scope of these disclosure requirements are included in the following table. Certain financial instruments that are not carried at fair value on the Consolidated Statement of Financial Condition are carried at amounts that approximate fair value due to their short-term nature and generally negligible credit risk. These instruments include cash, cash and securities segregated under federal and other regulations, securities purchased under resale agreements with short-dated maturities, securities borrowed with short-dated maturities, short-term receivables, other assets, commercial paper, short-term borrowings, securities sold under repurchase agreements with short-dated maturities, securities loaned with short-dated maturities, short-term payables, other liabilities and accrued expenses, beneficial interests issued by consolidated VIEs, long-term debt, and subordinated liabilities.

The following table presents by fair value hierarchy classification the carrying values and estimated fair values as of December 31, 2016, of financial assets and liabilities, excluding financial instruments that are carried at fair value on a recurring basis, and their classification within the fair value hierarchy.

		Estimated fair value hierarchy			
(in millions)	Carrying value	Level 1	Level 2	Level 3	Total estimated fair value
Financial assets					
Cash	$ 1,115	$ 1,115	$ –	$ –	$ 1,115
Cash and securities segregated under federal and other regulations	26,678	–	26,678	–	26,678
Securities purchased under resale agreements	101,119	–	101,119	–	101,119
Securities borrowed	72,755	–	72,755	–	72,755
Receivables from customers	16,419	–	16,419	–	16,419
Receivables from brokers, dealers, clearing organizations and others	17,689	–	17,686	3	17,689
Other assets	1,802	–	1,732	83	1,815
Financial liabilities					
Commercial paper	$ 11,738	$ –	$ 11,738	$ –	$ 11,738
Short-term borrowings	10,619	–	10,619	–	10,619
Securities sold under repurchase agreements	169,622	–	169,622	–	169,622
Securities loaned	14,648	–	14,648	–	14,648
Payables to customers	88,911	–	88,911	–	88,911
Payables to brokers, dealers, clearing organizations and others	4,585	–	4,585	–	4,585
Other liabilities and accrued expenses	1,882	–	1,875	7	1,882
Beneficial interests issued by consolidated VIEs	205	–	205	–	205
Long-term debt	500	–	501	–	501
Subordinated liabilities	14,000	–	14,114	–	14,114

4. Fair value option

The fair value option provides an option to elect fair value as an alternative measurement for selected financial assets, financial liabilities and unrecognized firm commitments.

The Company has elected to measure certain instruments at fair value for several reasons including to mitigate income statement volatility caused by the differences in the measurement basis of elected instruments (e.g. certain instruments elected were previously accounted for on an accrual basis) while the associated risk management arrangements are accounted for on a fair value basis, as well as to better reflect those instruments that are managed on a fair value basis.

The Company's election of fair value includes the following instruments:

- Loans managed on a fair value basis.
- Certain securities financing agreements with an embedded derivative and/or a maturity of greater than one year.
- Certain debt and equity investments to better reflect those which are managed on a fair value basis.
- Structured notes, which are predominantly financial instruments that contain embedded derivatives.
- Certain long-term beneficial interests issued by consolidated securitization trusts where the underlying assets are carried at fair value.

Difference between aggregate fair value and aggregate remaining contractual principal balance outstanding

The following table reflects the difference between the aggregate fair value and the aggregate remaining contractual principal balance outstanding as of December 31, 2016, for loans reported as financial instruments owned, long-term debt and long-term beneficial interests issued by consolidated VIEs for which the fair value option has been elected.

(in millions)	Contractual principal outstanding	Fair value	Fair value over/ (under) contractual principal outstanding
Loans reported as financial instruments owned	**$ 107**	**$ 102**	**$ (5)**
Long-term debt			
Principal-protected debt	$ 114[b]	$ 163	$ 49
Nonprincipal-protected debt[a]	NA	7,014	NA
Total long-term debt	**NA**	**$ 7,177**	**NA**
Long-term beneficial interests issued by consolidated VIEs			
Nonprincipal-protected debt[a]	NA	$ 72	NA
Total long-term beneficial interests issued by consolidated VIEs	**NA**	**$ 72**	**NA**

(a) Remaining contractual principal is not applicable to nonprincipal-protected notes. Unlike principal-protected structured notes, for which the Company is obligated to return a stated amount of principal at the maturity of the note, nonprincipal-protected structured notes do not obligate the Company to return a stated amount of principal at maturity, but to return an amount based on the performance of an underlying variable or derivative feature embedded in the note. However, investors are exposed to the credit risk of the Company as issuer for both nonprincipal-protected and principal-protected notes.

(b) Where the Company issues principal-protected zero-coupon or discount notes, the balance reflects the contractual principal payment at maturity or, if applicable, the contractual principal payment at the Company's next call date.

5. Derivative instruments

Derivative contracts derive their value from underlying asset prices, indices, reference rates, other inputs or a combination of these factors and may expose counterparties to risks and rewards of an underlying asset or liability without having to initially invest in, own or exchange the asset or liability. The Company uses derivatives predominantly to manage its own risk exposures.

Risk management derivatives

The Company manages certain market and credit risk exposures using derivative instruments.

Interest rate contracts are used to minimize fluctuations in earnings that are caused by changes in interest rates. Fixed rate assets and liabilities appreciate or depreciate in market value as interest rates change. The Company generally uses interest rate swaps, forwards and futures to manage the impact of interest rate fluctuations on earnings.

Foreign currency forward contracts are used to manage the foreign exchange risk associated with certain foreign currency–denominated (i.e., non-U.S. dollar) assets and liabilities. As a result of fluctuations in foreign currencies, the U.S. dollar–equivalent values of the foreign currency–denominated assets and liabilities increase or decrease.

Commodities contracts are used to manage the price risk of certain commodities-linked exchange-traded fund ("ETF") inventories. Gains or losses on these derivative instruments are expected to substantially offset the depreciation or appreciation of the related inventory.

The Company uses credit derivatives to manage the counterparty credit risk associated with debt-related securities. Credit derivatives compensate the purchaser when the entity referenced in the contract experiences a credit event, such as bankruptcy or a failure to pay an obligation when due. Credit derivatives primarily consist of credit default swaps.

Derivative counterparties and settlement types

The Company enters into OTC derivatives, which are negotiated and settled bilaterally with the derivative counterparty. The Company also enters into, as principal, certain exchange-traded derivatives ("ETD") such as futures and options, and cleared over-the-counter ("OTC-cleared") derivative contracts with central counterparties ("CCPs"). ETD contracts are generally standardized contracts traded on an exchange and cleared by the CCP, which is the counterparty from the inception of the transactions. OTC-cleared derivatives are traded on a bilateral basis and then novated to the CCP for clearing.

Derivative clearing services

The Company provides clearing services for clients where the Company acts as a clearing member with respect to certain derivative exchanges and clearing houses. The Company does not reflect the clients' derivative contracts on its Consolidated Statement of Financial Condition. For further information on the Company's clearing services, see Note 17.

Accounting for derivatives

All free-standing derivatives that the Company executes for its own account are required to be recorded on the Consolidated Statement of Financial Condition at fair value. As permitted under U.S. GAAP, the Company nets derivative assets and liabilities, and the related cash collateral receivables and payables, when a legally enforceable master netting agreement exists between the Company and the derivative counterparty. The accounting for changes in value of a derivative depends on whether or not the transaction has been designated and qualifies for hedge accounting. Derivatives that are not designated as hedges are reported and measured at fair value through earnings. The Company does not have any derivatives that are designated as hedges.

Notional amount of derivative contracts

The following table summarizes the notional amount of derivative contracts outstanding as of December 31, 2016.

(in millions)	Notional amounts[b]
Interest rate contracts	
Swaps	$ 268,194
Futures and forwards	473,661
Written options	20,232
Purchased options	4,161
Total interest rate contracts	**766,248**
Credit derivatives[a]	**24,001**
Foreign exchange contracts	
Spot, futures and forwards	15,365
Written options	71
Purchased options	183
Total foreign exchange contracts	**15,619**
Equity contracts	
Swaps	104,974
Futures and forwards	28,203
Written options	194,992
Purchased options	158,342
Total equity contracts	**486,511**
Commodity contracts	
Purchased options	177
Total commodity contracts	**177**
Total derivative notional amounts	**$ 1,292,556**

(a) For more information on volumes and types of credit derivative contracts, see the Credit derivative discussion in this Note.
(b) Represents the sum of gross long and gross short third-party and affiliate notional derivative contracts.

While the notional amounts disclosed above give an indication of the volume of the Company's derivative activity, the notional amounts significantly exceed, in the Company's view, the possible losses that could arise from such transactions. For most derivative transactions, the notional amount is not exchanged; it is used simply as a reference to calculate payments.

Impact of derivatives on the Consolidated Statement of Financial Condition

The following table summarizes information on derivative receivables and payables (before and after netting adjustments) that are reflected on the Company's Consolidated Statement of Financial Condition as of December 31, 2016, by contract type. This includes derivative receivables and payables with affiliates. For further discussion of derivative activities with affiliates, see Note 16.

Derivative receivables and payables[(a)]

(in millions)	Gross derivative receivables	Net derivative receivables	Gross derivative payables	Net derivative payables
Financial instruments owned and financial instruments sold, not yet purchased				
Interest rate	$ 3,739	$ 445	$ 3,349	$ 380
Credit	713	60	549	113
Foreign exchange	102	21	126	65
Equity	20,821	569	20,707	379
Total fair value of financial instruments owned and financial instruments sold, not yet purchased	**$ 25,375**	**$ 1,095**	**$ 24,731**	**$ 937**

(a) As permitted under U.S. GAAP, the Company has elected to net derivative receivables and derivative payables and the related cash collateral receivables and payables when a legally enforceable master netting agreement exists.

The following table presents, as of December 31, 2016, gross and net derivative receivables and payables by contract and settlement type under U.S. GAAP. Derivative receivables and payables, as well as the related cash collateral from the same counterparty have been netted on the Consolidated Statement of Financial Condition where the Company has obtained an appropriate legal opinion with respect to the master netting agreement. Where such a legal opinion has not been either sought or obtained, amounts are not eligible under U.S. GAAP for netting on the Consolidated Statement of Financial Condition, and those derivative receivables and payables are shown separately in the following table.

In addition to the cash collateral received and transferred that is presented on a net basis with net derivative receivables and payables, the Company receives and transfers additional collateral (financial instruments and cash). These amounts mitigate counterparty credit risk associated with the Company's derivative instruments but are not eligible for net presentation, because (a) the collateral consists of non-cash financial instruments (generally U.S. government and agency securities and other government bonds) and cash collateral held at third-party custodians, which are shown separately as "Collateral not nettable on the Consolidated Statement of Financial Condition" up to the fair value exposure amount, (b) the amount of collateral held or transferred exceeds the fair value exposure at the individual counterparty level, as of the date presented, or (c) the collateral held relates to derivative receivables or payables where an appropriate legal opinion has not been either sought or obtained with respect to the master netting agreement.

(in millions)	Derivative Receivables: Gross derivatives	Derivative Receivables: Amounts netted on the Consolidated Statement of Financial Condition[e]	Derivative Receivables: Net derivatives	Derivative Payables: Gross derivatives	Derivative Payables: Amounts netted on the Consolidated Statement of Financial Condition[e]	Derivative Payables: Net derivatives
U.S. GAAP nettable derivatives						
Interest rate contracts:						
OTC	$ 2,651	$ (2,479)	$ 172	$ 2,320	$ (2,154)	$ 166
OTC–cleared	874	(815)	59	815	(815)	–
Exchange-traded[a]	–	–	–	–	–	–
Total interest rate contracts	**3,525**	**(3,294)**	**231**	**3,135**	**(2,969)**	**166**
Credit contracts:						
OTC	709	(653)	56	546	(436)	110
OTC–cleared	–	–	–	–	–	–
Exchange-traded[a]	–	–	–	–	–	–
Total credit contracts	**709**	**(653)**	**56**	**546**	**(436)**	**110**
Foreign exchange contracts:						
OTC	82	(81)	1	77	(61)	16
OTC–cleared	–	–	–	–	–	–
Exchange-traded[a]	–	–	–	–	–	–
Total foreign exchange contracts	**82**	**(81)**	**1**	**77**	**(61)**	**16**
Equity contracts:						
OTC	18,457	(18,401)	56	18,856	(18,477)	379
OTC–cleared	–	–	–	–	–	–
Exchange-traded[a]	2,364	(1,851)	513	1,851	(1,851)	–
Total equity contracts	**20,821**	**(20,252)**	**569**	**20,707**	**(20,328)**	**379**
Derivatives with appropriate legal opinion	**25,137**	**(24,280)**	**857**	**24,465**	**(23,794)**	**671**
Derivatives where an appropriate legal opinion has not been either sought or obtained	**238**		**238**	**266**		**266**
Total derivatives recognized on the Consolidated Statement of Financial Condition	**$ 25,375**		**$ 1,095**	**$ 24,731**		**$ 937**
Collateral not nettable on the Consolidated Statement of Financial Condition[b][c][d]			**(36)**			**(1)**
Net amount			**$ 1,059**			**$ 936**

(a) Exchange-traded derivative amounts that relate to futures contracts are settled daily.
(b) Excludes all collateral related to derivative instruments where an appropriate legal opinion has not been either sought or obtained.
(c) Represents liquid security collateral as well as cash collateral held at third-party custodians related to derivative instruments where an appropriate legal opinion has been obtained. For some counterparties, the collateral amounts of financial instruments may exceed the derivative receivables and derivative payables balances. Where this is the case, the total amount reported is limited to the net derivative receivables and net derivative payables balances with that counterparty.
(d) Derivative payables collateral relates only to OTC and OTC-cleared derivative instruments. Amounts exclude collateral transferred related to exchange-traded.
(e) Derivative receivable netting included cash collateral of $902 million and derivative payable netting included cash collateral of $416 million.

Liquidity risk and credit-related contingent features

In addition to the specific market risks introduced by each derivative contract type, derivatives expose the Company to credit risk – the risk that derivative counterparties may fail to meet their payment obligations under the derivative contracts and the collateral, if any, held by the Company proves to be of insufficient value to cover the payment obligation. It is the policy of the Company to actively pursue, where possible, the use of legally enforceable master netting agreements and collateral agreements to mitigate derivative counterparty credit risk. The amount of derivative receivables reported on the Consolidated Statement of Financial Condition is the fair value of the derivative contracts after giving effect to legally enforceable master netting agreements and cash collateral held by the Company.

While derivative receivables expose the Company to credit risk, derivative payables expose the Company to liquidity risk, as the derivative contracts typically require the Company to post cash or securities collateral with counterparties as the fair value of the contracts moves in the counterparties' favor. Where the Company has legally enforceable master netting agreements and margin agreements with its affiliates, any associated derivatives are marked to market daily and the fair value of the related collateral is monitored with margin calls made daily between the Company and the affiliates.

The Company has no derivatives that contain contingent collateral or termination features that may be triggered upon a ratings downgrade of the Company or its affiliates.

Credit derivatives

Credit derivatives are financial instruments whose value is derived from the credit risk associated with the debt of a third-party issuer (the reference entity) and which allow one party (the protection purchaser) to transfer that risk to another party (the protection seller). Credit derivatives expose the protection purchaser to the creditworthiness of the protection seller, as the protection seller is required to make payments under the contract when the reference entity experiences a credit event, such as a bankruptcy, a failure to pay its obligation or a restructuring. The seller of credit protection receives a premium for providing protection but has the risk that the underlying instrument referenced in the contract will be subject to a credit event.

The Company uses credit derivatives primarily to mitigate credit risk associated with its credit market products and mortgage-backed securities.

Credit default swaps

Credit derivatives may reference the credit of either a single reference entity ("single-name") or a broad-based index. The Company purchases and sells protection on index-reference obligations. Single-name credit default swaps ("CDS") and index CDS contracts are typically OTC-cleared derivative contracts. Single-name CDS are used to manage the default risk of a single reference entity, while index CDS contracts are used to manage the credit risk associated with the broader credit markets or credit market segments. Like the S&P 500 and other market indices, a CDS index comprises a portfolio of CDS across many reference entities. New series of CDS indices are periodically established with a new underlying portfolio of reference entities to reflect changes in the credit markets. If one of the reference entities in the index experiences a credit event, then the reference entity that defaulted is removed from the index. CDS can also be referenced against specific portfolios of reference names or against customized exposure levels based on specific client demands: for example, to provide protection against the first $1 million of realized credit losses in a $10 million portfolio of exposure. Such structures are commonly known as tranche CDS.

For both single-name CDS contracts and index CDS contracts, upon the occurrence of a credit event, under the terms of a CDS contract neither party to the CDS contract has recourse to the reference entity. The protection purchaser has recourse to the protection seller for the difference between the face value of the CDS contract and the fair value of the reference obligation at settlement of the credit derivative contract, also known as the recovery value. The protection purchaser does not need to hold the debt instrument of the underlying reference entity in order to receive amounts due under the CDS contract when a credit event occurs.

The following table presents a summary of the notional amounts of credit derivatives the Company sold and purchased as of December 31, 2016.

The Company does not use notional amounts of credit derivatives as the primary measure of risk management for such derivatives because notional amount does not take into account the probability of occurrence of a credit event, the recovery value of the reference obligation, or related cash instruments and economic hedges, each of which reduces, in the Company's view, the risk associated with such derivatives.

Total credit derivatives

	Maximum payout/Notional amount			
(in millions)	Protection sold	Purchased protection with identical underlyings[(b)]	Net protection (sold)/ purchased[(c)]	Other protection purchased[(d)]
Credit derivatives				
Credit default swaps	$ (11,003)	$ 11,953	$ 950	$ 176
Other credit derivatives[(a)]	—	—	—	870
Total	**$ (11,003)**	**$ 11,953**	**$ 950**	**$ 1,046**

(a) Represents total return swaps with affiliates.
(b) Represents the notional amount of protection purchased where the underlying reference instrument is identical to the reference instrument on protection sold; the notional amount of protection purchased for each individual identical underlying reference instrument may be greater or lower than the notional amount of protection sold.
(c) Does not take into account the fair value of the reference obligation at the time of settlement, which would generally reduce the amount the seller of protection pays to the buyer of protection in determining settlement value.
(d) Represents protection purchased by the Company on referenced instruments (portfolio or index) where the Company has not sold any protection on the identical reference instrument.

The following table summarizes the notional and fair value amounts of credit derivatives as of December 31, 2016, where the Company is the seller of protection. The maturity profile is based on the remaining contractual maturity of the credit derivative contracts. The ratings profile is based on the rating of the reference entity on which the credit derivative contract is based. The ratings and maturity profile of credit derivatives where the Company is the purchaser of protection are comparable to the profile reflected in the following table.

Protection sold – credit derivatives ratings[(a)]/maturity profile

December 31, 2016 (in millions)	Under 1 year	1 - 5 years	After 5 years	Total notional amount	Fair value receivables[(b)]	Fair value payables[(b)]	Net fair value
Risk rating of reference entity							
Investment-grade	$ (70)	$ (53)	$ (4,844)	$ (4,967)	$ 1	$ (72)	$ (71)
Noninvestment-grade	(20)	(26)	(5,990)	(6,036)	6	(465)	(459)
Total	**$ (90)**	**$ (79)**	**$ (10,834)**	**$ (11,003)**	**$ 7**	**$ (537)**	**$ (530)**

(a) The ratings scale is primarily based on external credit ratings defined by S&P and Moody's.
(b) Amounts are shown on a gross basis, before the benefit of legally enforceable master netting agreements and cash collateral received by the Company.

6. Securities financing activities

The Company enters into resale agreements, repurchase agreements, securities borrowed transactions and securities loaned transactions (collectively, "securities financing agreements") primarily to finance the Company's inventory positions, acquire securities to cover short positions, accommodate customers' financing needs, and settle other securities obligations.

Resale and repurchase agreements are carried on the Consolidated Statement of Financial Condition at the amounts at which the securities will be subsequently sold or repurchased, plus accrued interest, except for amounts reported at fair value. Where appropriate under applicable accounting guidance, resale and repurchase agreements with the same counterparty are reported on a net basis. For further discussion of the offsetting of assets and liabilities, see Note 2.

The Company has elected the fair value option for certain resale and repurchase agreements. For further discussion of the fair value option, see Note 4.

Securities borrowed and securities loaned are generally carried at the amount of cash collateral advanced or received. In accordance with U.S. GAAP, certain securities are borrowed against securities collateral and the borrower is not required to record the transactions on its Consolidated Statement of Financial Condition. In addition, certain securities are loaned against securities collateral and the lender is required to record the securities received and related obligation to return securities received as collateral on its Consolidated Statement of Financial Condition.

Securities financing agreements expose the Company to credit and liquidity risk. To manage these risks, the Company monitors the value of the underlying securities that it has received from or provided to its counterparties compared to the value of cash principal advanced and exchanged collateral, and either requests additional collateral or returns securities or collateral when appropriate. Margin levels are initially established based upon the counterparty, the type of underlying securities, and the permissible collateral, and are monitored on an ongoing basis.

In resale agreements and securities borrowed transactions, the Company is exposed to credit risk to the extent that the value of the securities received is less than initial cash principal advanced and any collateral amounts exchanged. In repurchase agreements and securities loaned transactions, credit risk exposure arises to the extent that the value of underlying securities exceeds the value of the initial cash principal advanced and any collateral amounts exchanged.

Additionally, the Company typically enters into master netting agreements and other similar arrangements with its counterparties, which provide for the right to liquidate the underlying securities and any collateral amounts exchanged in the event of a counterparty default. It is also the Company's policy to take possession, where possible, of the securities underlying resale agreements and securities borrowed transactions.

The following table summarizes the gross and net amounts of the Company's securities financing agreements as of December 31, 2016. When the Company has obtained an appropriate legal opinion with respect to the master netting agreement with a counterparty and where other relevant netting criteria under U.S. GAAP are met, the Company nets, on the Consolidated Statement of Financial Condition, the balances outstanding under its securities financing agreements with the same counterparty. In addition, the Company exchanges securities and/or cash collateral with its counterparties; this collateral also reduces, in the Company's view, the economic exposure with the counterparty. Such collateral, along with securities financing balances that do not meet relevant netting criteria under U.S. GAAP, is presented as "Amounts not nettable on the Consolidated Statement of Financial Condition," and reduces the "Net amounts" presented in the following table, if the Company has an appropriate legal opinion with respect to the master netting agreement with the counterparty. Where a legal opinion has not been either sought or obtained, the securities financing balances are presented gross in the "Net amounts" in the following table, and related collateral does not reduce the amounts presented.

(in millions)	Gross amounts	Amounts netted on the Consolidated Statement of Financial Condition	Amounts presented on the Consolidated Statement of Financial Condition	Amounts not nettable on the Consolidated Statement of Financial Condition[d]	Net amounts[e]
Assets					
Securities purchased under resale agreements[a][b]	$ 307,230	$ (170,609)	$ 136,621	$ (134,735)	$ 1,886
Securities borrowed	72,755	–	72,755	(44,751)	28,004
Liabilities					
Securities sold under repurchase agreements[b]	$ 340,519	$ (170,609)	$ 169,910	$ (152,748)	$ 17,162
Securities loaned and other[c]	23,297	–	23,297	(23,176)	121

(a) Included $19.3 billion of securities represented on the Consolidated Statement of Financial Condition as cash and securities segregated under federal and other regulations.
(b) Securities purchased under resale agreements included $16.2 billion accounted for at fair value and securities sold under repurchase agreements included $288 million accounted for at fair value.
(c) Included securities-for-securities lending transactions of $8.6 billion when the Company is acting as lender. This amount is reported in obligation to return securities received as collateral on the Consolidated Statement of Financial Condition.
(d) In some cases, collateral exchanged with a counterparty exceeds the net asset or liability balance with that counterparty. In such cases, the amounts reported in this column are limited to the related asset or liability with that counterparty.
(e) Includes securities financing agreements that provide collateral rights, but where an appropriate legal opinion with respect to the master netting agreement has not been either sought or obtained. At December 31, 2016, included $334 million of securities purchased under resale agreements; $25.1 billion of securities borrowed; $15.9 billion of securities sold under agreements to repurchase; and $81 million of securities loaned and other.

The following tables present as of December 31, 2016 the types of financial assets pledged in securities financing agreements and the remaining contractual maturity of the securities financing agreements.

	Gross liability balance	
(in millions)	Securities sold under repurchase agreements	Securities loaned and other[a]
Mortgage-backed securities	$ 10,403	$ –
U.S. Treasury and government agencies	295,132	1,413
Non-U.S. government securities	134	–
Corporate debt securities	10,023	24
Equity securities	15,721	21,860
U.S. state and municipal obligations	2,491	–
Asset-backed securities	6,615	–
Total	**$ 340,519**	**$ 23,297**

	Remaining contractual maturity of the agreements				
(in millions)	Overnight and continuous	Up to 30 days	30-90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	$ 169,602	$ 81,560	$ 61,073	$ 28,284	$ 340,519
Total securities loaned and other[a]	15,182	49	2,401	5,665	23,297

(a) Included securities-for-securities lending transactions of $8.6 billion when the Company is acting as lender. This amount is reported in obligation to return securities received as collateral on the Consolidated Statement of Financial Condition.

7. Income taxes

Deferred income tax expense/(benefit) results from differences between assets and liabilities as measured for financial reporting and income tax return purposes. At December 31, 2016, the Company had a net deferred tax asset of $582 million. The significant components of the deferred tax asset, as of the Consolidated Statement of Financial Condition date, relates primarily to compensation-related benefits, federal and state tax benefits in regards to tax reserves, and reserves for litigation. As of December 31, 2016, management has determined it is more likely than not that the Company will realize its deferred tax assets.

At December 31, 2016, the Company had a current federal income tax receivable of $228 million and a state income tax payable of $73 million to JPMorgan Chase included on the Consolidated Statement of Financial Condition.

The following table presents a reconciliation of the beginning and ending amount of unrecognized tax benefits for the year ended December 31, 2016.

(in millions)	**Unrecognized tax benefits**
Balance at January 1, 2016	**$ 78**
Increases based on tax positions related to prior periods	4
Decreases related to settlements with taxing authorities	(2)
Balance at December 31, 2016	**$ 80**

At December 31, 2016, the Company's unrecognized tax benefit, excluding related interest expense and penalties, was $80 million, of which $54 million, if recognized, would reduce the annual effective tax rate.

At December 31, 2016, in addition to the Company's liability for unrecognized tax benefits, the Company had accrued $40 million for income tax-related interest expense and no penalties.

The Company is a member of the JPMorgan Chase consolidated group which is continually under examination by the Internal Revenue Service and by many state and local jurisdictions throughout the U.S. The following table summarizes the status of significant income tax examinations of JPMorgan Chase and its consolidated subsidiaries as of December 31, 2016.

December 31, 2016	Periods under examination	Status
JPMorgan Chase - U.S.	2003 - 2005	Appellate level
JPMorgan Chase - U.S.	2006 - 2010	Field examination of amended returns; certain matters at Appellate level
JPMorgan Chase - U.S.	2011 - 2013	Field examination
JPMorgan Chase - New York State	2008 - 2011	Field examination
JPMorgan Chase - New York City	2008 - 2011	Field examination
JPMorgan Chase - California	2011 - 2012	Field examination

8. Commercial paper

As of December 31, 2016, outstanding commercial paper had maturities ranging from January 2017 to December 2017 that bear interest of 78 to 158 basis points. Issuance is based on a spread to either the one-month or three-month London Interbank Borrowing Offered Rate (“LIBOR”) depending on the tenor of issuance.

The maximum face amount of commercial paper outstanding during the year ended December 31, 2016, was $19.2 billion, which was outstanding on February 26, 2016.

9. Short-term borrowings

At December 31, 2016, the Company had $3.4 billion of unsecured short-term borrowings from JPMorgan Chase Holdings LLC (“Chase Holdings”) bearing interest at rates approximating the U.S. Federal Funds Effective Rate pursuant to a committed $8.0 billion credit facility. In addition, the Company had non-U.S. dollar unsecured borrowings of $250 million from JPMorgan Chase Bank, National Association bearing interest at the Euro Interbank Offered Rate.

In addition, the Company had issued $221 million of unsecured short-term debt payable to affiliates, which represents fully-funded OTC derivatives that qualify as short-term debt for accounting purposes based on the funding component of the instrument. The Company has elected to measure these instruments at fair value under the fair value option.

The Company also had $6.9 billion of short-term borrowings to third parties of which $6.8 billion represented secured short-term financings that bear interest of 69 to 151 basis points. Issuance is based on a spread to the one-month, three-month or six-month LIBOR depending on the tenor of issuance. These borrowings are secured by a combination of financial instruments owned and securities received in as collateral.

10. Long-term debt

At December 31, 2016, the Company had issued $7.2 billion of unsecured long-term debt payable to affiliates, which represents fully-funded OTC derivatives that qualify as long-term debt for accounting purposes based on the funding component of the instrument. The Company has elected to measure these instruments at fair value under the fair value option.

At December 31, 2016, the Company had issued $500 million of secured long-term debt to third parties that bear interest at 61 basis points over three-month LIBOR which matures in July 2017. The debt is secured by securities received in as collateral.

The following table is a summary of long-term debt carrying values including unamortized premiums and discounts, issuance costs, valuation adjustments and fair value adjustments, where applicable by remaining contractual maturity as of December 31, 2016.

(in millions)		Under 1 year	1 - 5 years	After 5 years	Total
Long-term debt	Variable rate notes	$ 2,880	$ 4,152	$ 645	$ 7,677

11. Subordinated liabilities

On November 29, 2016, the Company terminated and repaid its subordinated liabilities with JPMorgan Chase and simultaneously received commitments from Chase Holdings that provide subordinated liabilities up to a maximum amount of $14.0 billion. At December 31, 2016, $14.0 billion was payable under these subordinated borrowing agreements, and they mature as follows.

(in millions)

Year	Amount
2018	$6,000
2021	8,000
Total subordinated liabilities	**$14,000**

All subordinated liabilities of the Company have been approved by the Financial Industry Regulatory Authority ("FINRA") and the Chicago Mercantile Exchange ("CME"), and therefore, qualify as capital in computing net capital under the SEC's Uniform Net Capital Rule ("Net Capital Rule"). The subordinated debt obligations may only be repaid if the Company is in compliance with the applicable terms of the Net Capital Rule.

The subordinated liabilities bear interest at a spread of 104-148 basis points over one-month LIBOR.

12. Employee compensation and benefits

The Company's employees participate, to the extent they meet minimum eligibility requirements, in various benefit plans sponsored by JPMorgan Chase. The following is a discussion of JPMorgan Chase's significant benefit plans.

Employee stock-based awards

Certain employees of the Company participate in JPMorgan Chase's long-term stock-based incentive plans, which provide for grants of common stock-based awards, including stock options, stock-settled stock appreciation rights ("SARs") and restricted stock units ("RSUs"). Employees receive annual incentive compensation based on their performance, the performance of their business and JPMorgan Chase's consolidated operating results.

U.S. GAAP requires all share-based payments to employees that qualify as equity awards be measured at their grant-date fair values. JPMorgan Chase uses the Black-Scholes valuation model to estimate the fair value of stock options and SARs. JPMorgan Chase separately recognizes compensation expense for each tranche of each award, net of estimated forfeitures, as if it were a separate award with its own vesting date. Generally, for each tranche granted, compensation expense is recognized on a straight-line basis from the grant date until the vesting date of the respective tranche, provided that the employees will not become full-career eligible during the vesting period. For awards with full-career eligibility provisions and awards granted with no future substantive service requirement, JPMorgan Chase accrues the estimated value of awards expected to be awarded to employees as of the grant date, without giving consideration to the impact of post-employment restrictions. For each tranche granted to employees who will become full-career eligible during the vesting period, compensation expense is recognized on a straight-line basis from the grant date until the earlier of the employee's full-career eligibility date or the vesting date of the respective tranche.

JPMorgan Chase RSUs

RSUs are awarded at no cost to the recipient upon their grant. Generally, RSUs are granted annually and vest at a rate of 50% after two years and 50% after three years and are converted into shares of JPMorgan Chase common stock as of the vesting date. In addition, RSUs typically include full-career eligibility provisions, which allow employees to continue to vest upon voluntary termination, subject to post-employment and other restrictions based on age or service-related requirements. All RSUs awards are subject to forfeiture until vested and contain clawback provisions that may result in cancellation under certain specified circumstances. RSUs entitle the recipient to receive cash payments equivalent to any dividends paid on the underlying common stock during the period the RSU is outstanding.

JPMorgan Chase employee stock options and SARs

Employee stock options and SARs have generally been granted with an exercise price equal to the fair value of JPMorgan Chase's common stock on the grant date. JPMorgan Chase periodically grants employee stock options to individual employees. There were no material grants of stock options or SARs in 2016. Prior grants of SARs generally become exercisable ratably over five years (i.e., 20% per year) and contain full-career eligibility provisions and clawback provisions similar to RSUs. SARs generally expire ten years after the grant date.

The following table presents grant and forfeiture activity of JPMorgan Chase stock-based awards to the Company's employees for the year ended December 31, 2016.

(in thousands)	
RSUs	
Granted	8,798
Forfeited	477
Options and SARs	
Granted	3
Forfeited	10

At December 31, 2016, the Company's employees held 20 million unvested RSUs. In addition, 2 million options and SARs were held by the Company's employees at December 31, 2016, of which 242 thousand awards had not vested. In the normal course of business, the employment relationship of certain employees may transfer between the Company and JPMorgan Chase or its subsidiaries which may impact the Company's outstanding awards.

There are no separate plans solely for the employees of the Company and, therefore, the stock-based compensation expense for the Company is determined based upon employee participation in the JPMorgan Chase plans and effected through a charge from JPMorgan Chase, which is cash settled monthly.

For a discussion of the accounting policies and other information relating to employee stock-based compensation, refer to Note 10 of JPMorgan Chase & Co.'s 2016 Annual Report on Form 10-K for the year ended December 31, 2016 ("JPMorgan Chase's 2016 Annual Report").

Pension and other postretirement employee benefits
JPMorgan Chase has various defined benefit pension plans and other postretirement employee benefit ("OPEB") plans that provide benefits to its employees. The Company's employees are eligible to participate in JPMorgan Chase's qualified, noncontributory U.S. defined benefit pension plan and they may also participate in JPMorgan Chase's defined contribution plan. In addition, postretirement medical and life insurance benefits are offered to certain retirees, and postretirement medical benefits are offered to qualifying U.S. employees, through JPMorgan Chase's U.S. OPEB plans. Benefits vary based on the length of an employee's service and their date of hire, and provide for limits on the Company's share of covered medical benefits. The medical and life insurance benefits are both contributory. There are no separate plans solely for employees of the Company and, therefore, pension expense, defined contribution and OPEB expense for the Company is determined based upon employee participation in the JPMorgan Chase plans and are recorded through an intercompany charge from JPMorgan Chase, which is settled in cash monthly.

Consolidated disclosures about the defined benefit pension, defined contribution and OPEB plans of JPMorgan Chase, including their funded status, plan assumptions, investment strategy and asset allocation, fair value measurement of plan assets and liabilities, and other disclosures about the plans are included in Note 9 of JPMorgan Chase's 2016 Annual Report.

13. Variable interest entities
At December 31, 2016, the Company consolidated the assets and liabilities of certain VIEs as it was deemed to be the primary beneficiary as it has both the power to direct the activities of those VIEs that most significantly impacts the VIEs' economic performance and, through its interests in the VIEs, the obligation to absorb losses or the right to receive benefits from the VIEs that could potentially be significant to the VIEs. JPMorgan Chase considers a "sponsored" VIE to include any entity where: (1) JPMorgan Chase is the principal beneficiary of the structure; (2) the VIE is used by JPMorgan Chase to securitize its assets; (3) the VIE issues financial instruments using JPMorgan Chase's name; or (4) the entity is a JPMorgan Chase-administered asset-backed commercial paper conduit.

Mortgage and other securitization trusts sponsored by affiliates
The Company engages in underwriting and trading activities involving securities issued by JPMorgan Chase-sponsored securitization trusts. As a result, the Company at times retains senior and/or subordinated interests (including residual interests) in residential and commercial mortgage securitizations upon securitization, and/or reacquires positions in the secondary market in the normal course of business. In certain instances as a result of the positions retained or reacquired, when considered together with the power to direct the activities of the VIEs, the Company is deemed to be the primary beneficiary of certain securitization trusts.

At December 31, 2016, the Company held $661 million of interests in residential and commercial mortgage securitization VIEs sponsored by affiliates (these VIEs are not consolidated by the Company as it is not the primary beneficiary). Interests held were recorded as financial instruments owned on the Company's Consolidated Statement of Financial Condition and valued at fair value. The principal amount outstanding of assets in nonconsolidated JPMorgan Chase-sponsored securitization VIEs with continuing involvement was $67.4 billion at December 31, 2016.

Residential mortgages
The Company does not consolidate a residential mortgage securitization (affiliate-sponsored or third-party-sponsored) when it does not hold a beneficial interest in the trust that could potentially be significant to the trust or when the Company does not have the power to direct the activities of the VIE. Generally, the Company is not the servicer of these securities and therefore does not have the power to direct the most significant activities of the trust. At December 31, 2016, the Company did not consolidate the assets of certain JPMorgan Chase-sponsored residential mortgage securitization VIEs, in which the Company had continuing involvement, primarily due to the fact that the Company did not hold an interest in these trusts that could potentially be significant to the trusts.

Commercial mortgages and other consumer securitizations
The Company engages in underwriting and trading activities involving securities issued by JPMorgan Chase-sponsored securitization trusts. The Company may retain unsold senior and/or subordinated interests in commercial mortgage securitizations at the time of securitization. The Company does not service the underlying commercial loans, and it does not consolidate the commercial mortgage securitization trusts as it does not have the power to direct the significant activities of the VIE which are generally held by the servicer or investors in a specified class of securities ("controlling class").

Re-securitizations
The Company engages in certain re-securitization transactions in which debt securities are transferred to a VIE in exchange for new beneficial interests. These transfers occur in connection with both agency (Federal National Mortgage Association ("Fannie Mae"), Federal Home Loan Mortgage Company ("Freddie Mac") and Government National Mortgage Association ("Ginnie Mae")), and non-agency (private-label) sponsored VIEs, which may be backed by either residential or commercial mortgages. The Company's consolidation analysis is largely dependent on the Company's role and interests in the re-securitization trusts. During the year ended December 31, 2016, the Company transferred $11.2 billion of securities to agency VIEs and $647 million of securities to private-label VIEs.

Most re-securitizations with which the Company is involved are client-driven transactions in which a specific client or group of clients are seeking a specific return or risk profile. For these transactions, the Company has concluded that the decision-making power of the entity is shared between the Company and its clients, considering the joint effort and decisions in establishing the re-securitization trust and its assets, as well as the significant economic interest the clients hold in the re-securitization trust; therefore, at December 31, 2016, the Company did not consolidate such re-securitization VIEs.

In more limited circumstances, the Company creates a nonagency re-securitization trust independently and not in conjunction with specific clients. In these circumstances, the Company is deemed to have the unilateral ability to direct the most significant activities of the re-securitization trust because of the decisions made during the establishment and design of the trust; therefore, the Company consolidates the re-securitization VIE if it holds an interest that could potentially be significant.

Additionally, the Company may invest in beneficial interests of third-party re-securitizations and generally purchases these interests in the secondary market. In these circumstances, the Company does not have the unilateral ability to direct the most significant activities of the re-securitization trust, either because it wasn't involved in the initial design of the trust, or the Company is involved with an independent third-party-sponsor and demonstrates shared power over the creation of the trust; therefore, at December 31, 2016, the Company did not consolidate such re-securitization VIEs.

As of December 31, 2016, total assets (including the notional amount of interest-only securities) of nonconsolidated JPMorgan Chase-sponsored private-label re-securitization entities in which the Company has continuing involvement was $352 million. The Company held approximately $2.0 billion of interests in nonconsolidated agency re-securitization entities and $41 million of senior and subordinated interests in nonconsolidated private-label re-securitization entities.

As of December 31, 2016, the Company did not consolidate any agency re-securitizations. As of December 31, 2016, the Company consolidated an insignificant amount of assets and liabilities of JPMorgan Chase-sponsored private-label re-securitizations.

Municipal bond vehicles
Municipal bond vehicles or tender option bond ("TOB") trusts allow investors to finance their municipal bond investments at short-term rates. In a typical TOB transaction, the trust purchases highly rated municipal bond(s) of a single issuer and funds the purchase by issuing two types of securities: (1) puttable floating-rate certificates ("Floaters") and (2) inverse

floating-rate residual interests ("Residuals"). The Floaters are typically purchased by money market funds or other short-term investors and may be tendered, with requisite notice, to the TOB trust. The Residuals are retained by the investor seeking to finance its municipal bond investment. TOB transactions where the Residual is held by a third-party investor are typically known as Customer TOB trusts, and Non-Customer TOB trusts are transactions where the Residual is retained by the Company, JPMorgan Chase or an affiliate. The Company serves as sponsor for certain Non-Customer TOB transactions and certain Customer TOB transactions established prior to 2014. The Company may provide various services to a TOB trust, including remarketing agent, liquidity or tender option provider, and/or sponsor.

The Company may serve as a remarketing agent on the Floaters for TOB trusts. The remarketing agent is responsible for establishing the periodic variable rate on the Floaters, conducting the initial placement and remarketing of tendered Floaters. The remarketing agent may, but is not obligated to, make markets in Floaters. At December 31, 2016, the Company held an insignificant amount of these Floaters on its Consolidated Statement of Financial Condition.

The Company often serves as the sole liquidity or tender option provider for the TOB trusts. The liquidity provider's obligation to perform is conditional and is limited by certain events ("Termination Events"), which include bankruptcy or failure to pay by the municipal bond issuer or credit enhancement provider, an event of taxability on the municipal bonds or the immediate downgrade of the municipal bond to below investment-grade. In addition, the liquidity provider's exposure is typically further limited by the high credit quality of the underlying municipal bonds, the excess collateralization in the vehicle, or, in certain transactions, the reimbursement agreements with the Residual holders.

Holders of the Floaters may "put," or tender, their Floaters to the TOB trust. If the remarketing agent cannot successfully remarket the Floaters to another investor, the liquidity provider either provides a loan to the TOB trust for the purchase of or directly purchases the tendered Floaters.

TOB trusts are considered to be variable interest entities. The Company consolidates Non-Customer TOB trusts because as the Residual holder, the Company has the right to make decisions that significantly impact the economic performance of the municipal bond vehicle, and has the right to receive benefits and bear losses that could potentially be significant to the municipal bond vehicle. The Company does not consolidate Customer TOB trusts, since the Company does not have the power to make decisions that significantly impact the economic performance of the municipal bond vehicle.

Consolidated VIE assets and liabilities

As of December 31, 2016, the Company included the following on its Consolidated Statement of Financial Condition related to consolidated VIEs.

	Assets	Liabilities
(in millions)	Financial instruments owned	Beneficial interests issued by consolidated VIEs
Mortgage securitization entities	$102	$72
Municipal bond vehicles	206	205
Total	**$308**	**$277**

14. Enterprise-wide risk management

Risk is an inherent part of JPMorgan Chase's business activities. When JPMorgan Chase makes markets in securities, or offers other products or services, JPMorgan Chase takes on some degree of risk. JPMorgan Chase's overall objective is to manage its businesses, and the associated risks, in a manner that balances serving the interests of its clients, customers and investors and protects the safety and soundness of JPMorgan Chase.

JPMorgan Chase's Firmwide Risk Management is overseen and managed on an enterprise-wide basis. JPMorgan Chase's approach to risk management covers a broad spectrum of risk areas, such as credit, country, liquidity, market, compliance, conduct, legal, model, operational, and reputation risk, with controls and governance established for each area, as appropriate.

JPMorgan Chase believes that effective risk management requires:

- Acceptance of responsibility, including identification and escalation of risk issues, by all individuals within JPMorgan Chase;
- Ownership of risk identification, assessment, data and management within each of the lines of business and corporate functions; and
- JPMorgan Chase Firmwide structures for risk governance.

The Company is included in this risk management approach.

JPMorgan Chase's Operating Committee, which consists of JPMorgan Chase's Chief Executive Officer ("CEO"), Chief Risk Officer ("CRO"), Chief Operating Officer ("COO"), Chief Financial Officer ("CFO") and other senior executives, is the ultimate management escalation point in JPMorgan Chase, and may refer matters to JPMorgan Chase's Board of Directors. The Operating Committee is responsible and accountable to JPMorgan Chase's Board of Directors.

JPMorgan Chase strives for continual improvement through efforts to enhance controls, ongoing employee training and development, talent retention, and other measures. JPMorgan Chase follows a disciplined and balanced compensation framework with strong internal governance and independent Board oversight. The impact of risk and control issues are carefully considered in JPMorgan Chase's performance evaluation and incentive compensation processes.

The following sections outline the key risks that are inherent in the Company's business activities.

Credit risk
Credit risk is the risk of loss arising from the default of a customer, client or counterparty. See Note 15 for further information.

Country risk
Country risk is the risk that a sovereign event or action alters the value or terms of contractual obligations of obligors, counterparties and issuers or adversely affects markets related to a particular country. JPMorgan Chase has a comprehensive country risk management framework for assessing country risks, determining risk tolerance, and measuring and monitoring direct country exposures within JPMorgan Chase. The Country Risk Management group is responsible for developing guidelines and policies for managing country risk in both emerging and developed countries. The Country Risk Management group actively monitors the various portfolios giving rise to country risk to ensure JPMorgan Chase's country risk exposures are diversified and that exposure levels are appropriate given JPMorgan Chase's strategy and risk tolerance relative to a country.

The Country Risk Management group, part of the independent risk management function, works in close partnership with other risk functions to assess and monitor country risk within JPMorgan Chase. JPMorgan Chase's Firmwide Risk Executive for Country Risk reports to JPMorgan Chase's CRO.

Country Risk Management is responsible for the following functions:

- Developing guidelines and policies consistent with a comprehensive country risk framework.
- Assigning sovereign ratings and assessing country risks.
- Measuring and monitoring country risk exposure and stress across JPMorgan Chase.
- Managing country limits and reporting trends and limit breaches to senior management.
- Developing surveillance tools for early identification of potential country risk concerns.
- Providing country risk scenario analysis.

Liquidity risk
Liquidity risk is the risk that JPMorgan Chase will be unable to meet its contractual and contingent obligations or that it does not have the appropriate amount, composition and tenor of funding and liquidity to support its assets and liabilities.

JPMorgan Chase has a liquidity risk oversight function whose primary objective is to provide assessment, measurement, monitoring, and control of liquidity risk across JPMorgan Chase. Liquidity risk oversight is managed through a dedicated JPMorgan Chase Firmwide Liquidity Risk Oversight group. JPMorgan Chase's Chief Investment Office ("CIO"), Treasury and Corporate ("CTC") CRO, who reports to the CRO, as part of the independent risk management function, has responsibility for JPMorgan Chase Firmwide Liquidity Risk Oversight. Liquidity Risk Oversight's responsibilities include but are not limited to:

- Establishing and monitoring limits, indicators, and thresholds, including liquidity appetite tolerances;
- Defining, monitoring, and reporting internal JPMorgan Chase Firmwide and material legal entity liquidity stress tests, and monitoring and reporting regulatory defined liquidity stress testing;
- Monitoring and reporting liquidity positions, balance sheet variances and funding activities;
- Conducting ad hoc analysis to identify potential emerging liquidity risks.

Market risk
Market risk is the risk of loss arising from potential adverse changes in the value of JPMorgan Chase's assets and liabilities resulting from changes in market variables such as interest rates, foreign exchange rates, equity prices, commodity prices, implied volatilities or credit spreads.

Market Risk Management monitors market risks throughout JPMorgan Chase and defines market risk policies and procedures. The Market Risk Management function reports to JPMorgan Chase's CRO.

Market Risk Management seeks to manage risk, facilitate efficient risk/return decisions, reduce volatility in operating performance and provide transparency into JPMorgan Chase's market risk profile for senior management, the Board of Directors and regulators. Market Risk Management is responsible for the following functions:

- Establishment of a market risk policy framework.
- Independent measurement, monitoring and control of line of business and JPMorgan Chase market risk.
- Definition, approval and monitoring of limits.
- Performance of stress testing and qualitative risk assessments.

Compliance risk
Compliance risk is the risk of failure to comply with applicable laws, rules, and regulations.

Each line of business is accountable for managing its compliance risk. JPMorgan Chase's Compliance Organization ("Compliance"), which is independent of the lines of business, works closely with senior management to provide independent review, monitoring and oversight of business operations with a focus on compliance with the legal and regulatory obligations applicable to the offering of JPMorgan Chase's products and services to clients and customers.

These compliance risks relate to a wide variety of legal and regulatory obligations, depending on the line of business and the jurisdiction, and include those related to products and services, relationships and interactions with clients and customers, and employee activities.

Conduct risk
Conduct risk is the risk that an employee's action or inaction causes undue harm to JPMorgan Chase's clients and customers, damages market integrity, undermines JPMorgan Chase's reputation, or negatively impacts JPMorgan Chase's culture.

Each line of business or function is accountable for identifying and managing its conduct risk to provide appropriate engagement, ownership and sustainability of a culture consistent with JPMorgan Chase's How We Do Business Principles ("Principles"). The Principles serve as a guide for how employees are expected to conduct themselves. With the Principles serving as a guide, JPMorgan Chase's Code of Conduct ("Code") sets out JPMorgan Chase's expectations for each employee and provides certain information and the resources to help employees conduct business ethically and in compliance with the law everywhere JPMorgan Chase operates.

Legal risk
Legal risk is the risk of loss or imposition of damages, fines, penalties or other liability arising from the failure to comply with a contractual obligation or to comply with laws, rules or regulations to which JPMorgan Chase is subject.

In addition to providing legal services and advice to JPMorgan Chase, and communicating and helping the lines of business adjust to the legal and regulatory changes they face, including the heightened scrutiny and expectations of JPMorgan Chase's regulators, the global Legal function is responsible for working with the businesses and corporate functions to fully understand and assess their adherence to laws, rules and regulations. In particular, Legal assists Oversight & Control, Risk, Finance, Compliance and Internal Audit in their efforts to ensure compliance with all applicable laws and regulations and JPMorgan Chase's corporate standards for doing business. JPMorgan Chase's lawyers also advise JPMorgan Chase on potential legal exposures on key litigation and transactional matters, and perform a significant defense and advocacy role by defending JPMorgan Chase against claims and potential claims and, when needed, pursuing claims against others.

Model risk
Model risk is the potential for adverse consequences from decisions based on incorrect or misused model outputs.

JPMorgan Chase uses models across various businesses and functions. The models are of varying levels of sophistication and are used for many purposes including, for example, the valuation of positions and the measurement of risk, such as assessing regulatory capital requirements, conducting stress testing, and making business decisions.

The Model Risk function reviews and approves a wide range of models, including risk management, valuation and regulatory capital models used by JPMorgan Chase. The Model Risk function is independent of model users and developers. JPMorgan Chase's Firmwide Model Risk Executive reports to JPMorgan Chase's CRO.

Operational risk

Operational risk is the risk of loss resulting from inadequate or failed processes or systems, human factors, or due to external events that are neither market- nor credit-related. Operational risk is inherent in JPMorgan Chase's activities and can manifest itself in various ways, including fraudulent acts, business interruptions, inappropriate employee behavior, failure to comply with applicable laws and regulations or failure of vendors to perform in accordance with their arrangements. These events could result in financial losses, litigation and regulatory fines, as well as other damages to JPMorgan Chase. The goal is to keep operational risk at appropriate levels in light of JPMorgan Chase's financial strength, the characteristics of its businesses, and the markets and regulatory environments in which it operates.

To monitor and control operational risk, JPMorgan Chase has an Operational Risk Management Framework ("ORMF") which is designed to enable JPMorgan Chase to maintain a sound and well-controlled operational environment. The ORMF is comprised of four main components: Governance, Risk Assessment, Measurement, and Monitoring and Reporting.

Other operational risks

As mentioned previously, operational risk can manifest itself in various ways. Risks such as Compliance risk, Conduct risk, Legal risk and Model risk as well as other operational risks, can lead to losses which are captured through the Company's operational risk measurement processes. Details on other select operational risks are provided below.

Cybersecurity risk

JPMorgan Chase devotes significant resources to protect the security of its computer systems, software, networks and other technology assets. JPMorgan Chase's security efforts are intended to protect against cybersecurity attacks by unauthorized parties to obtain access to confidential information, destroy data, disrupt or degrade service, sabotage systems or cause other damage. JPMorgan Chase continues to make significant investments in enhancing its cyber defense capabilities and to strengthen its partnerships with the appropriate government and law enforcement agencies and other businesses in order to understand the full spectrum of cybersecurity risks in the environment, enhance defenses and improve resiliency against cybersecurity threats. Third parties with which JPMorgan Chase does business or that facilitate JPMorgan Chase's business activities (e.g., vendors, exchanges, clearing houses, central depositories, and financial intermediaries) could also be sources of cybersecurity risk to JPMorgan Chase. Third party cybersecurity incidents such as system breakdowns or failures, misconduct by the employees of such parties, or cyberattacks could affect their ability to deliver a product or service to JPMorgan Chase or result in lost or compromised information of JPMorgan Chase or its clients. Clients can also be sources of cybersecurity risk to JPMorgan Chase, particularly when their activities and systems are beyond JPMorgan Chase's own security and control systems. However, where cybersecurity incidents are due to client failure to maintain the security of their own systems and processes, clients will generally be responsible for losses incurred.

To protect the confidentiality, integrity and availability of JPMorgan Chase's infrastructure, resources and information, JPMorgan Chase leverages the ORMF to ensure risks are identified and managed within defined corporate tolerances. JPMorgan Chase's Board of Directors and the Audit Committee are regularly briefed on JPMorgan Chase's cybersecurity policies and practices as well as its efforts regarding significant cybersecurity events.

Payment fraud risk

Payment fraud risk is the risk of external and internal parties unlawfully obtaining personal benefit at the expense of JPMorgan Chase. Over the past year, the risk of payment fraud has increased across the industry, with the number of attempts hitting record highs. The complexities of these attacks along with perpetrators' strategies continue to evolve. A Payments Control Program has been established that includes Cybersecurity, Operations, Technology, Risk and the lines of business to manage the risk, implement controls and provide client education and awareness training. The program monitors and measures payment fraud activity, evaluates JPMorgan Chase's cybersecurity defenses, limits access to sensitive data, and provides training to both employees and clients.

Third-party outsourcing risk

To identify and manage the operational risk inherent in its outsourcing activities, JPMorgan Chase has a Third-Party Oversight ("TPO") framework to assist lines of business and corporate functions in selecting, documenting, onboarding, monitoring and managing their supplier relationships. The objective of the TPO framework is to hold third parties to the same high level of operational performance as is expected of JPMorgan Chase's internal operations. The Third-Party Oversight group is responsible for JPMorgan Chase's Firmwide TPO training, monitoring, reporting and standards.

Business and technology resiliency risk
Business disruptions can occur due to forces beyond JPMorgan Chase's control such as severe weather, power or telecommunications loss, flooding, transit strikes, terrorist threats or infectious disease. The safety of JPMorgan Chase's employees and customers is of the highest priority. JPMorgan Chase's global resiliency program is intended to ensure that JPMorgan Chase has the ability to recover its critical business functions and supporting assets (i.e., staff, technology and facilities) in the event of a business interruption. The program includes corporate governance, awareness and training, as well as strategic and tactical initiatives to identify, assess, and manage business interruption and public safety risks.

The strength and proficiency of JPMorgan Chase's global resiliency program has played an integral role in maintaining JPMorgan Chase's business operations during and quickly after various events.

Reputation risk
Reputation risk is the risk that an action, transaction, investment or event will reduce trust in JPMorgan Chase's integrity or competence by its various constituents, including clients, counterparties, investors, regulators, employees and the broader public. Maintaining JPMorgan Chase's reputation is the responsibility of each individual employee of JPMorgan Chase. JPMorgan Chase's Reputation Risk Governance policy explicitly vests each employee with the responsibility to consider the reputation of JPMorgan Chase when engaging in any activity. Since the types of events that could harm JPMorgan Chase's reputation are so varied across JPMorgan Chase's lines of business, each line of business has a separate reputation risk governance infrastructure in place, which consists of three key elements: clear, documented escalation criteria appropriate to the business; a designated primary discussion forum – in most cases, one or more dedicated reputation risk committees; and a list of designated contacts, to whom questions relating to reputation risk should be referred. Line of business reputation risk governance is overseen by a JPMorgan Chase Firmwide Reputation Risk Governance function which provides oversight of the governance infrastructure and process to support the consistent identification, escalation, management and monitoring of reputation risk issues across JPMorgan Chase.

15. Customer activities

Customer credit risks
The Company's activities for both clearing clients and customers, including affiliates (collectively "customers"), involve the execution, settlement and financing of customers' securities, and derivative transactions. Derivative transactions primarily include futures, swaps, contracts for difference, forwards, options and various structured products. The Company provides the ability for customers to execute and settle securities and derivative transactions on listed exchanges, as well as in the OTC markets. Securities and derivative transactions may be settled on a cash basis or financed on a margin basis. The collateral requirements on a margin loan are established based on either regulatory guidelines or internal risk-based requirements for clients that use leverage products offered by the Company.

In connection with certain customer activities, the Company executes and settles customer transactions involving the short sale of securities ("short sales"). When a customer sells a security short, the Company may be required to borrow securities to settle a customer short sale transaction and, as such, these transactions may expose the Company to a potential loss if customers are unable to fulfill their contractual obligations and customers' collateral balances are insufficient to fully cover their losses. In the event customers fail to satisfy their obligations, the Company may be required to purchase financial instruments at prevailing market prices to fulfill the customers' obligations.

It is the policy of the Company to mitigate the risks associated with its customers' activities by requiring customers to maintain margin collateral in compliance with various regulatory and internal guidelines. The Company monitors required margin levels and, pursuant to such guidelines, may require customers to deposit additional cash or other collateral, or to reduce positions, when deemed necessary. The Company also establishes credit limits for customers engaged in derivative activities and monitors credit compliance. Additionally, with respect to the Company's correspondent clearing activities, introducing correspondent firms generally guarantee the contractual obligations of their customers. Further, it is the policy of the Company to reduce credit risk by entering into legally enforceable master netting agreements with customers, which permit receivables and payables with such customers to be offset in the event of a customer default.

In connection with the Company's customer financing and securities settlement activities, the Company may pledge customers' securities as collateral to satisfy the Company's margin deposit requirements with exchanges or to support its various secured financing sources such as borrowings, securities loaned and repurchase agreements. In the event counterparties are unable to meet their contractual obligations to return customers' securities pledged as collateral, the Company may be exposed to the risk of acquiring the securities at prevailing market prices to satisfy its obligations to such customers. The Company seeks to control this risk by monitoring the market values of securities pledged and by requiring adjustments of collateral levels in the event of excess exposure. Moreover, the Company establishes credit limits for such activities and monitors compliance with such credit limits.

Concentrations of credit risks

The Company is engaged in providing securities processing services to a diverse group of individuals and institutional investors, including affiliates. A substantial portion of the Company's transactions are collateralized and may be executed with, or made on behalf of, institutional investors, including other brokers and dealers, commercial banks, insurance companies, pension plans, mutual funds, hedge funds and other financial institutions. The Company's exposure to credit risk associated with the nonperformance of customers in fulfilling their contractual obligations pursuant to securities and derivative transactions can be directly affected by volatile or illiquid trading markets, which may impair customers' ability to satisfy their obligations to the Company. The Company attempts to minimize credit risk associated with these activities by monitoring customers' credit exposure and collateral values and requiring, when deemed necessary, additional collateral to be deposited with the Company.

A significant portion of the Company's securities processing activities include clearing and settling transactions for hedge funds, brokers and dealers and other professional traders, including affiliates. Due to the nature of these operations, which may include significant levels of credit extension such as leveraged purchases, short selling and option writing, the Company may have significant credit exposure should these customers be unable to meet their commitments. In addition, the Company may be subject to concentration risk through providing margin to those customers holding large positions in certain types of securities, securities of a single issuer, including sovereign governments, issuers located in a particular country or geographic area or issuers engaged in a particular industry, where the Company receives such large positions as collateral. The Company seeks to control these risks by monitoring margin collateral levels for compliance with both regulatory and internal guidelines. Additional collateral is obtained when necessary. To further control these risks, the Company has developed automated risk control systems that analyze the customers' sensitivity to major market movements. The Company will require customers to deposit additional margin collateral, or reduce positions, if it is determined that customers' activities may be subject to above normal market risk.

The Company acts as a clearing broker for securities and futures and options activities of certain affiliates on either a fully disclosed or omnibus basis. Such activities are conducted on either a cash or margin basis. The Company requires its affiliates to maintain margin collateral in compliance with various regulatory guidelines. The Company monitors required margin levels and requests additional collateral when deemed appropriate.

16. Related parties

The Company has significant transactions with JPMorgan Chase and its subsidiaries. Various JPMorgan Chase subsidiaries engage the Company to arrange for the purchase or sale of securities, clearing activities, collateralized transactions, manage portfolios of securities, market derivative instruments, structure complex transactions and provide and receive operational support and services. Balances with related parties as of December 31, 2016, are listed in the following table.

(in millions)		
Assets		
Cash	$	613
Cash and securities segregated under federal and other regulations		7,333
Securities purchased under resale agreements		7,007
Securities borrowed		5,079
Receivables from brokers, dealers, clearing organizations and others		1,621
Financial instruments owned, at fair value[(a)]		1,284
Other assets		266
Liabilities		
Short-term borrowings (included $221 at fair value)	$	3,898
Securities sold under repurchase agreements		75,342
Securities loaned		4,263
Payables to customers		9,279
Payables to brokers, dealers, clearing organizations and others		1,308
Financial instruments sold, not yet purchased, at fair value[(a)]		661
Other liabilities and accrued expenses		25
Long-term debt, at fair value		7,177
Subordinated liabilities		14,000

(a) As of December 31, 2016, financial instruments owned included $50 million of derivative receivables from affiliates; the remaining $1.2 billion is comprised of corporate debt and structured notes obligations of its affiliates, as well as common and preferred shares issued by JPMorgan Chase. Financial instruments sold, not yet purchased included $379 million of derivative payables to affiliates; the remaining $282 million is comprised of corporate debt obligations issued by JPMorgan Chase and its affiliates.

17. Commitments, guarantees, pledged assets, collateral and contingencies

The Company provides various commitments and guarantees to meet the financing needs of its customers. The contractual amount of these financial instruments represents the maximum possible credit risk to the Company should the counterparty draw upon the commitment or the Company be required to fulfill its obligation under the guarantee, and should the counterparty subsequently fail to perform according to the terms of the contract. Most of these commitments and guarantees expire without being drawn or a default occurring. As a result, the total contractual amount of these instruments is not, in the Company's view, representative of its actual future credit exposure or funding requirements.

The following table summarizes the contractual amounts and carrying values of commitments and guarantees at December 31, 2016.

	Contractual amount					Carrying value
December 31, 2016 (in millions)	Expires in 1 year or less	Expires after 1 year through 3 years	Expires after 3 years through 5 years	Expires after 5 years	Total	
Commitments and guarantees						
Unsettled securities purchased under resale agreements	$ 3,922	$ –	$ –	$ –	$ 3,922	$ –
Unsettled securities sold under repurchase agreements	3,534	–	–	–	3,534	–
Unfunded commitments to extend credit[(a)]	4,599	–	–	–	4,599	–
Derivatives qualifying as guarantees	357	332	–	–	689	32

(a) Represents collateralized committed facilities.

Unsettled resale and repurchase agreements

In the normal course of business, the Company enters into resale and repurchase agreements that settle at a future date. At settlement, these commitments require that the Company advance cash to and accept securities from the counterparty.

These agreements generally do not meet the definition of a derivative, and therefore, are not recorded on the Consolidated Statement of Financial Condition until settlement date.

Collateralized committed facilities
Collateralized committed facilities are conditional lending commitments issued by the Company for secured financings. The Company has such facilities in place with certain customers and certain clearing houses of which it is a member. The Company does not hold collateral to support undrawn commitments under these facilities. However, before advancing funds the Company takes possession of collateral (generally securities) and continues to monitor the market value of the collateral during the term of the financing, which includes requesting or returning additional collateral when appropriate.

Derivatives qualifying as guarantees
The Company transacts certain derivative contracts that have the characteristics of a guarantee under U.S. GAAP. The total contractual amount reported represents the notional value of the derivatives that the Company deems to be guarantees. The notional amount generally represents the Company's maximum exposure to derivatives qualifying as guarantees. The Company reduces exposures to these contracts by entering into offsetting transactions, or by entering into contracts that hedge the market risk related to the derivative guarantees.

In addition to derivative contracts that meet the characteristics of a guarantee, the Company is both a purchaser and seller of credit protection in the credit derivatives market. For further discussion of credit derivatives, see Note 5.

Clearing services
The Company provides clearing services for clients entering into securities purchases and sales, and derivative transactions with CCPs, including ETDs such as futures and options, as well as OTC-cleared derivative contracts. As a clearing member, the Company stands behind the performance of its clients, collects cash and securities collateral (margin) as well as any settlement amounts due from or to clients, and remits them to the relevant CCP or client in whole or part. There are two types of margin. Variation margin is posted on a daily basis based on the value of clients' derivative contracts. Initial margin which is posted at inception of a derivative contract, generally on the basis of the potential changes in the variation margin requirement for the contract.

As a clearing member, the Company is exposed to the risk of nonperformance by its clients, but is not liable to clients for the performance of the CCP's. Where possible, the Company seeks to mitigate its risks to the client through the collection of appropriate amounts of margin at inception and throughout the life of the transactions. The Company may cease providing clearing services to a client if the client does not adhere to their obligations under the clearing agreement. In the event of nonperformance by a client, the Company would close out the client's positions and access available margin. The CCP would utilize any margin it holds to make itself whole, with any remaining shortfalls required to be paid by the Company as a clearing member.

The Company reflects its exposure to nonperformance risk of the client through the recognition of margin payables or receivables to clients and CCPs, but does not reflect the clients' underlying securities or derivative contracts on its Consolidated Statement of Financial Condition.

It is difficult to estimate the Company's maximum possible exposure through its role as a clearing member, as this would require an assessment of transactions that clients may execute in the future. However, based on credit risk management practices and historical experience, and the credit risk mitigants available to the Company, management believes it is unlikely that the Company will have to make any material payments under these arrangements and the risk of loss is expected to be remote.

For information on the derivatives that the Company executes for its own account and records on its Consolidated Statement of Financial Condition, see Note 5.

Exchange and clearing house guarantees
The Company is a member of several securities and derivative exchanges and clearing houses, both in the U.S. and other countries, and it provides clearing services. Membership in some of these organizations requires the Company to pay a pro rata share of the losses incurred by the organization as a result of the default of another member. Such obligations vary with different organizations. These obligations may be limited to members who dealt with the defaulting member or to the amount (or a multiple of the amount) of the Company's contribution to the guarantee fund maintained by a clearing house or exchange as part of the resources available to cover any losses in the event of a member default. Alternatively, these obligations may be a full pro-rata share of the residual losses after applying the guarantee fund. Additionally, certain clearing houses require the Company as a member to pay a pro rata share of losses resulting from the clearing house's investment

of guarantee fund contributions and initial margin, unrelated to and independent of the default of another member. Generally a payment would only be required should such losses exceed the resources of the clearing house or exchange that are contractually required to absorb the losses in the first instance. It is difficult to estimate the Company's maximum possible exposure under these membership agreements, since this would require an assessment of future claims that may be made against the Company that have not yet occurred. However, based on historical experience, management expects the risk of loss to be remote.

The selection of clearing houses, as well as custodians and bank depositories, is reviewed as part of the Company's risk management process.

Guarantees of subsidiaries
In the normal course of business, JPMorgan Securities may guarantee certain of the obligations of its consolidated subsidiaries. The obligations of the consolidated subsidiaries are included on the Company's Consolidated Statement of Financial Condition; therefore, the Company has not recognized a separate liability for these guarantees. The Company believes that the occurrence of any event that would trigger payments under these guarantees is remote.

Lease commitments
The following table presents required future minimum rental payments for office space under noncancelable operating leases that expire after December 31, 2016.

Year ended December 31, 2016 (in millions)	
2017	$3
2018	3
2019	2
2020	1
2021	1
Total minimum payments required	**$10**

Pledged assets
The Company may pledge or otherwise provide financial assets to collateralize repurchase agreements, securities loan agreements and other financing agreements, to cover customer short sales and to satisfy margin deposits at clearing and depository organizations. Certain of these pledged assets may be sold or repledged or otherwise used by the secured parties and are identified as financial instruments owned (pledged to various parties) on the Consolidated Statement of Financial Condition. In addition, at December 31, 2016, the Company had pledged $14.8 billion of financial assets that may not be sold or repledged or otherwise used by the secured parties. Total assets pledged do not include assets of consolidated VIEs, which are used to settle the liabilities of those entities.

Collateral
At December 31, 2016, the Company had accepted financial assets as collateral that it could sell or repledge, deliver or otherwise use with a fair value of approximately $535.5 billion. This collateral was generally obtained under resale agreements, securities borrowing agreements, customer margin loans and derivative agreements. In many instances, the Company is permitted to rehypothecate the securities received as collateral, subject to regulations which prohibit the rehypothecation of customer fully-paid and excess margin securities, as set forth in customer protection SEC Rule 15c3-3. Of the collateral received, approximately $521.5 billion was repledged, delivered or otherwise used. Collateral was generally used under repurchase agreements, securities lending agreements or to cover short sales and to collateralize derivative agreements.

Litigation
The Company is a defendant in a number of legal proceedings. The Company has established reserves for certain of its currently outstanding legal proceedings. In accordance with the provisions of U.S. GAAP for contingencies, the Company accrues for a litigation-related liability when it is probable that such a liability has been incurred and the amount of the loss can be reasonably estimated. The Company evaluates its outstanding legal proceedings periodically to assess its litigation reserves, and makes adjustments in such reserves, upwards or downward, as appropriate, based on management's best judgment after consultation with counsel. There is no assurance that the Company's litigation reserves will not need to be adjusted in the future.

In view of the inherent difficulty of predicting the outcome of legal proceedings, the Company cannot state with confidence what will be the eventual outcomes of the currently pending matters, the timing of their ultimate resolution or the eventual losses, fines, penalties or impact related to those matters. The Company believes, based upon its current knowledge, after consultation with counsel and after taking into account its current litigation reserves, that the legal proceedings currently pending against it should not have a material adverse effect on the Company's Consolidated Statement of Financial Condition. The Company notes, however, that in light of the uncertainties involved in such proceedings, there is no assurance that the ultimate resolution of these matters will not significantly exceed the reserves it has currently accrued or that a matter will not have material reputational consequences. As a result, the outcome of a particular matter may be material to the Company's operating results for a particular period, depending on, among other factors, the size of the loss or liability imposed and the level of the Company's income for that period.

The Company believes it has meritorious defenses to the claims asserted against it in its currently outstanding litigation and, with respect to such litigation, intends to continue to defend itself vigorously, litigating or settling cases according to management's judgement. Many of the Company's litigation matters involve claims made against several of the Company's affiliates and are managed centrally by JPMorgan Chase. For further discussion on certain litigation cases relating to JPMorgan Chase, including the estimate of the range of reasonably possible losses for JPMorgan Chase's litigation portfolio, please refer to Note 31 of JPMorgan Chase's 2016 Annual Report.

18. Net capital and other regulatory requirements

JPMorgan Securities is a registered broker-dealer and FCM and, accordingly, is subject to SEC Rule 15c3-1 under the Net Capital Rule and Rule 1.17 under the CFTC. The SEC has approved JPMorgan Securities' use of Appendix E of the Net Capital Rule, which establishes alternative net capital requirements ("net capital") for broker-dealers that are part of entities subject to consolidated supervision at the ultimate holding company level. Appendix E allows JPMorgan Securities to calculate net capital charges for market risk and derivatives-related credit risk based on mathematical models provided that it holds tentative net capital in excess of $1.0 billion and net capital in excess of $500 million. JPMorgan Securities is also required to notify the SEC in the event that tentative net capital is less than $5.0 billion. Under these rules, JPMorgan Securities is required to maintain minimum net capital, as defined, of not less than the greater of: (i) 2% of aggregate debit items arising from customer transactions, as defined in the Net Capital Rule, plus excess margin collateral on resale agreements; or (ii) 8% of customer risk maintenance margin requirements plus 8% of non-customer risk maintenance margin requirements, all as defined in the capital rules of the CFTC. FINRA may require a member firm to reduce its business if its net capital is less than 4% of aggregate debit items and may prohibit a member firm from expanding its business or paying cash dividends if its net capital is less than 5% of aggregate debit items.

At December 31, 2016, JPMorgan Securities' net capital of $14.7 billion exceeded the minimum net capital requirement of $2.8 billion by $11.9 billion.

JPMorgan Securities is subject to the customer protection SEC Rule 15c3-3 under the Securities Exchange Act of 1934. As of December 31, 2016, cash and qualified securities segregated in a special reserve account for the exclusive benefit of customers was $19.3 billion. These amounts are included on the Consolidated Statement of Financial Condition in cash and securities segregated under federal and other regulations.

JPMorgan Securities also performs the computation for assets in the proprietary accounts of broker-dealers ("PAB") in accordance with the PAB reserve computation set forth in SEC Rule 15c3-3 under the Securities Exchange Act of 1934, so as to enable introducing brokers to include PAB assets as allowable assets in their net capital computations (to the extent allowable under the Net Capital Rule). As of December 31, 2016, there was no required deposit for the proprietary accounts of brokers, and therefore no cash or securities were on deposit.

Additionally, JPMorgan Securities, in their capacity as a FCM is required to perform computations of the requirements of Section 4d(2), Regulation 30.7, and Regulation 22.2 under the Commodity Exchange Act. As of December 31, 2016, assets segregated, secured and sequestered by JPMorgan Securities totaled $35.3 billion, which exceeded requirements by $3.0 billion.

19. Subsequent events

The Company has performed an evaluation of events that have occurred subsequent to December 31, 2016, and through February 28, 2017 (the date of the filing of this report). Other than the event disclosed in Note 1, Credit ratings, there have been no material subsequent events that occurred during such period that would require disclosure or recognition on the Consolidated Statement of Financial Condition.