JPMORGAN CHASE BANK, NATIONAL ASSOCIATION

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

CONSOLIDATED FINANCIAL STATEMENTS

For the three years ended December 31, 2017

FOR THE THREE YEARS ENDED DECEMBER 31, 2017

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Report of Independent Auditors

To the Board of Directors and Stockholder of JPMorgan Chase Bank, National Association

We have audited the accompanying consolidated financial statements of JPMorgan Chase Bank, National Association and its subsidiaries, which comprise the consolidated balance sheets as of December 31, 2017 and 2016, and the related consolidated statements of income, comprehensive income, changes in stockholder's equity and cash flows for each of the three years in the period ended December 31, 2017.

Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on the consolidated financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the Company's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of JPMorgan Chase Bank, National Association and its subsidiaries as of December 31, 2017 and 2016, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2017 in accordance with accounting principles generally accepted in the United States of America.

PricewaterhouseCoopers LLP

February 27, 2018

PricewaterhouseCoopers LLP • 300 Madison Avenue • New York, NY 10017

Consolidated statements of income

JPMorgan Chase Bank, National Association
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

Year ended December 31, (in millions)	2017	2016	2015
Revenue			
Investment banking fees	$ 3,419	$ 2,699	$ 1,931
Principal transactions	9,880	9,963	9,085
Lending- and deposit-related fees	5,940	5,780	5,693
Asset management, administration and commissions	11,730	11,133	11,263
Securities gains/(losses)	(73)	130	202
Mortgage fees and related income	1,616	2,487	2,513
Card income	4,510	4,246	4,333
Other income	4,771	4,806	4,671
Noninterest revenue	41,793	41,244	39,691
Interest income	48,099	41,584	37,425
Interest expense	7,067	4,642	3,736
Net interest income	41,032	36,942	33,689
Total net revenue	82,825	78,186	73,380
Provision for credit losses	1,845	2,486	1,376
Noninterest expense			
Compensation expense	24,291	23,240	23,128
Occupancy expense	3,450	3,301	3,438
Technology, communications and equipment expense	7,256	6,390	5,747
Professional and outside services	5,066	4,989	5,268
Marketing	949	881	796
Other expense	10,304	9,659	10,719
Total noninterest expense	51,316	48,460	49,096
Income before income tax expense	29,664	27,240	22,908
Income tax expense	10,734	7,868	5,980
Net income	$ 18,930	$ 19,372	$ 16,928

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated statements of comprehensive income

JPMorgan Chase Bank, National Association
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

Year ended December 31, (in millions)		2017		2016		2015
Net income	**$**	**18,930**	$	19,372	$	16,928
Other comprehensive income/(loss), after-tax						
Unrealized gains/(losses) on investment securities		**687**		(1,037)		(2,104)
Translation adjustments, net of hedges		**(309)**		4		(17)
Cash flow hedges		**176**		(55)		46
Defined benefit pension and OPEB plans		**11**		(27)		139
DVA on fair value option elected liabilities		**(55)**		(51)		–
Total other comprehensive income/(loss), after-tax		**510**		(1,166)		(1,936)
Comprehensive income	**$**	**19,440**	$	18,206	$	14,992

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated balance sheets

JPMorgan Chase Bank, National Association
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

December 31, (in millions, except share data)		2017		2016
Assets				
Cash and due from banks	**$**	**21,890**	$	21,202
Deposits with banks		**439,989**		388,655
Federal funds sold and securities purchased under resale agreements (included **$2,894** and $5,349 at fair value)		**155,214**		172,607
Securities borrowed (included **$3,049** and $0 at fair value)		**39,009**		32,497
Trading assets (included assets pledged of **$49,939** and $51,303)		**249,223**		245,329
Securities (included **$199,364** and $234,870 at fair value and assets pledged of **$23,170** and $19,116)		**247,097**		285,038
Loans (included **$2,508** and $2,228 at fair value)		**826,213**		792,119
Allowance for loan losses		**(10,081)**		(10,715)
Loans, net of allowance for loan losses		**816,132**		781,404
Accrued interest and accounts receivable		**48,063**		40,805
Premises and equipment		**13,481**		13,491
Goodwill, MSRs and other intangible assets		**33,570**		33,396
Other assets (included **$7,454** and $41 at fair value and assets pledged of **$1,465** and $1,429)		**77,110**		68,379
Total assets[(a)]	**$**	**2,140,778**	$	2,082,803
Liabilities				
Deposits (included **$21,380** and $13,965 at fair value)	**$**	**1,534,907**	$	1,480,238
Federal funds purchased and securities loaned or sold under repurchase agreements (included **$3,405** and $399 at fair value)		**94,692**		74,778
Short-term borrowings (included **$5,577** and $5,571 at fair value)		**8,993**		12,179
Trading liabilities		**96,737**		111,700
Accounts payable and other liabilities (included **$7,454** and $7,494 at fair value)		**91,200**		84,239
Beneficial interests issued by consolidated variable interest entities		**4,853**		7,451
Long-term debt (included **$21,401** and $14,936 at fair value)		**97,711**		107,131
Total liabilities[(a)]		**1,929,093**		1,877,716
Commitments and contingencies (see Notes 25, 26 and 27)				
Stockholder's equity				
Preferred stock ($1 par value; authorized 15,000,000 shares: issued **0** shares)		**—**		—
Common stock ($12 par value; authorized **200,000,000** shares; issued **148,761,243** shares)		**1,785**		1,785
Additional paid-in capital		**94,283**		94,125
Retained earnings		**114,242**		108,312
Accumulated other comprehensive income		**1,375**		865
Total stockholder's equity		**211,685**		205,087
Total liabilities and stockholder's equity	**$**	**2,140,778**	$	2,082,803

(a) The following table presents information on assets and liabilities related to variable interest entities ("VIEs") that are consolidated by JPMorgan Chase Bank, N.A. at December 31, 2017 and 2016. The difference between total VIE assets and liabilities represents JPMorgan Chase Bank, N.A.'s interests in those entities, which were eliminated in consolidation.

December 31, (in millions)		2017		2016
Assets				
Trading assets	**$**	**1,380**	$	2,655
Loans		**27,072**		29,695
All other assets		**1,698**		2,150
Total assets	**$**	**30,150**	$	34,500
Liabilities				
Beneficial interests issued by consolidated variable interest entities	**$**	**4,853**	$	7,451
All other liabilities		**254**		377
Total liabilities	**$**	**5,107**	$	7,828

The assets of the 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 JPMorgan Chase Bank, N.A. At December 31, 2017 and 2016, JPMorgan Chase Bank, N.A. provided limited program-wide credit enhancement of $2.7 billion and $2.4 billion, respectively, related to its JPMorgan Chase Bank, N.A.-administered multi-seller conduits, which are eliminated in consolidation. For further discussion, see Note 15.

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated statements of changes in stockholder's equity

JPMorgan Chase Bank, National Association
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

Year ended December 31, (in millions)	2017	2016	2015
Common stock			
Balance at January 1 and December 31	**$ 1,785**	$ 1,785	$ 1,785
Additional paid-in capital			
Balance at January 1	**94,125**	92,782	90,801
Cash capital contribution from JPMorgan Chase & Co.	**–**	327	4
Adjustments to capital due to transactions with JPMorgan Chase & Co.	**158**	1,016	1,977
Balance at December 31	**94,283**	94,125	92,782
Retained earnings			
Balance at January 1	**108,312**	98,951	89,082
Cumulative effect of change in accounting principle	**–**	(11)	–
Net income	**18,930**	19,372	16,928
Cash dividends paid to JPMorgan Chase & Co.	**(13,000)**	(10,000)	(8,000)
Net internal legal entity mergers	**–**	–	941
Balance at December 31	**114,242**	108,312	98,951
Accumulated other comprehensive income			
Balance at January 1	**865**	2,020	3,956
Cumulative effect of change in accounting principle	**–**	11	–
Other comprehensive income/(loss)	**510**	(1,166)	(1,936)
Balance at December 31	**1,375**	865	2,020
Total stockholder's equity	**$ 211,685**	$ 205,087	$ 195,538

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated statements of cash flows

JPMorgan Chase Bank, National Association
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

Year ended December 31, (in millions)	**2017**	2016	2015
Operating activities			
Net income	**$ 18,930**	$ 19,372	$ 16,928
Adjustments to reconcile net income to net cash provided by/(used in) operating activities:			
Provision for credit losses	**1,845**	2,486	1,376
Depreciation and amortization	**5,863**	5,144	4,559
Deferred tax expense	**(105)**	1,964	1,050
Other	**73**	(130)	(202)
Originations and purchases of loans held-for-sale	**(94,628)**	(61,107)	(49,197)
Proceeds from sales, securitizations and paydowns of loans held-for-sale	**93,264**	60,196	50,451
Net change in:			
Trading assets	**9,927**	2,955	38,192
Securities borrowed	**(6,462)**	(6,977)	7,106
Accrued interest and accounts receivable	**(7,741)**	(4,535)	1,623
Other assets	**(1,414)**	4,936	(486)
Trading liabilities	**(28,084)**	6,156	(22,417)
Accounts payable and other liabilities	**1,118**	(14)	(1,938)
Other operating adjustments	**4,341**	7,099	1,024
Net cash provided by/(used in) operating activities	**(3,073)**	37,545	48,069
Investing activities			
Net change in:			
Deposits with banks	**(51,334)**	(72,305)	164,927
Federal funds sold and securities purchased under resale agreements	**17,415**	(24,180)	(6,666)
Held-to-maturity securities:			
Proceeds from paydowns and maturities	**4,563**	6,218	6,099
Purchases	**(2,349)**	(143)	(6,204)
Available-for-sale securities:			
Proceeds from paydowns and maturities	**55,583**	65,478	76,303
Proceeds from sales	**89,418**	45,853	37,362
Purchases	**(105,134)**	(122,253)	(68,027)
Proceeds from sales and securitizations of loans held-for-investment	**15,791**	15,429	17,975
Other changes in loans, net	**(56,535)**	(77,085)	(104,819)
All other investing activities, net	**(101)**	(286)	2,544
Net cash provided by/(used in) investing activities	**(32,683)**	(163,274)	119,494
Financing activities			
Net change in:			
Deposits	**42,875**	169,139	(131,456)
Federal funds purchased and securities loaned or sold under repurchase agreements	**19,877**	(2,472)	(17,057)
Short-term borrowings	**(4,412)**	(17,971)	(8,103)
Beneficial interests issued by consolidated variable interest entities	**(988)**	(926)	(5,587)
Proceeds from long-term borrowings	**20,511**	37,406	16,728
Payments of long-term borrowings	**(30,200)**	(47,987)	(22,719)
Cash capital contribution from JPMorgan Chase & Co.	**—**	327	4
Dividends paid to JPMorgan Chase & Co.	**(13,000)**	(10,000)	(8,000)
All other financing activities, net	**1,698**	200	1,620
Net cash provided by/(used in) financing activities	**36,361**	127,716	(174,570)
Effect of exchange rate changes on cash and due from banks	**83**	(144)	(271)
Net increase/(decrease) in cash and due from banks	**688**	1,843	(7,278)
Cash and due from banks at the beginning of the period	**21,202**	19,359	26,637
Cash and due from banks at the end of the period	**$ 21,890**	$ 21,202	$ 19,359
Cash interest paid	**$ 6,978**	$ 4,552	$ 3,366
Cash income taxes paid, net[(a)]	**3,736**	3,613	8,272

(a) Includes $1.5 billion, $2.6 billion, and $7.5 billion paid to JPMorgan Chase & Co. in 2017, 2016 and 2015, respectively.

The Notes to Consolidated Financial Statements are an integral part of these statements.

Note 1 – Overview and basis of presentation

JPMorgan Chase Bank, National Association ("JPMorgan Chase Bank, N.A."), is a wholly-owned bank 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. JPMorgan Chase Bank, N.A. is a national banking association that is chartered by the office of the Comptroller of the Currency ("OCC"), a bureau of the United States Department of the Treasury. JPMorgan Chase Bank, N.A.'s main office is located in Columbus, Ohio, and it has retail branches in 23 states. JPMorgan Chase Bank, N.A. operates nationally as well as through non-U.S. bank branches and subsidiaries, and representative offices. JPMorgan Chase Bank, N.A. either directly or through such offices, branches and subsidiaries offers a wide range of banking services to its U.S. and non-U.S. customers including investment banking, financial services for consumers and small businesses, commercial banking, financial transactions processing and asset management. Under the J.P. Morgan and Chase brands, JPMorgan Chase Bank, N.A. serves millions of customers in the U.S. and many of the world's most prominent corporate, institutional and government clients.

The JPMorgan Chase Bank, N.A. Board of Directors is responsible for the oversight of the management of JPMorgan Chase Bank, N.A. The JPMorgan Chase Bank, N.A. Board accomplishes this function acting directly and through the principal standing committees of JPMorgan Chase's Board of Directors. Risk and control oversight on behalf of JPMorgan Chase Bank N.A. is primarily the responsibility of the Directors' Risk Policy Committee ("DRPC") and Audit Committee of JPMorgan Chase's Board of Directors, respectively, and, with respect to compensation and other management-related matters, the Compensation & Management Development Committee of JPMorgan Chase's Board of Directors.

The accounting and financial reporting policies of JPMorgan Chase Bank, N.A. and its subsidiaries 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.

Certain amounts reported in prior periods have been reclassified to conform with the current presentation.

Supervision and regulation

JPMorgan Chase and its subsidiaries (including JPMorgan Chase Bank, N.A.) are subject to extensive and comprehensive regulation under state and federal laws in the U.S., as well as the applicable laws of each of the various jurisdictions outside the U.S. in which JPMorgan Chase does business.

Financial holding company:

Consolidated supervision by the Board of Governors of the Federal Reserve System (the "Federal Reserve"). As a bank holding company ("BHC") and a financial holding company, JPMorgan Chase is subject to comprehensive consolidated supervision, regulation and examination by the Federal Reserve. The Federal Reserve acts as an "umbrella regulator" and certain of JPMorgan Chase's subsidiaries are regulated directly by additional regulatory authorities based on the particular activities of those subsidiaries. For example, JPMorgan Chase's national bank subsidiaries, JPMorgan Chase Bank, N.A. and Chase Bank USA, N.A., are subject to supervision and regulation by the OCC and, with respect to certain matters, by the Federal Reserve and the Federal Deposit Insurance Corporation (the "FDIC"). Certain non-bank subsidiaries, such as JPMorgan Chase's U.S. broker-dealers, are subject to supervision and regulation by the Securities and Exchange Commission (the "SEC") and, subsidiaries that engage in certain futures-related and swaps-related activities are subject to supervision and regulation by the Commodity Futures Trading Commission ("CFTC"). J.P. Morgan Securities plc, is a U.K. bank licensed within the European Economic Area (the "EEA") to undertake all banking activity and is regulated by the U.K. Prudential Regulation Authority (the "PRA"), a subsidiary of the Bank of England which has responsibility for prudential regulation of banks and other systemically important institutions, and by the U.K. Financial Conduct Authority ("FCA"), which regulates conduct matters for all market participants. JPMorgan Chase's other non-U.S. subsidiaries are regulated by the banking and securities regulatory authorities in the countries in which they operate. See Securities and broker-dealer regulation, Investment management regulation and Derivatives regulation below. In addition, JPMorgan Chase's consumer activities are subject to supervision and regulation by the Consumer Financial Protection Bureau ("CFPB") and to regulation under various state statutes which are enforced by the respective state's Attorney General.

Scope of permissible business activities. The Bank Holding Company Act generally restricts BHCs from engaging in business activities other than the business of banking and certain closely-related activities. Financial holding companies generally can engage in a broader range of financial activities than are otherwise permissible for BHCs, including underwriting, dealing and making markets in securities, and making merchant banking investments in non-financial companies. The Federal Reserve has the authority to limit a financial holding company's ability to conduct otherwise permissible activities if the financial holding company or any of its depository institution subsidiaries ceases to meet the applicable eligibility requirements (including requirements that the financial holding company and each of its U.S. depository institution subsidiaries maintain their status as "well-capitalized" and "well-managed"). The Federal Reserve may also impose corrective capital and/or managerial requirements on the financial holding company and may, for example, require divestiture of the holding company's depository institutions if the deficiencies persist. Federal regulations also provide that if any depository institution controlled by a financial holding company fails to maintain a satisfactory rating under the Community Reinvestment Act, the Federal Reserve must prohibit the financial holding company and its subsidiaries from engaging in any activities other than those permissible for bank holding companies. In addition, a financial holding company must obtain Federal Reserve approval before engaging in certain banking and other financial activities both in the U.S. and internationally, as further described under Regulation of acquisitions below.

Activities restrictions under the Volcker Rule. Section 619 (the "Volcker Rule") of the Wall Street Reform and Consumer Protection Act (the "Dodd-Frank Act") prohibits banking entities, including JPMorgan Chase, from engaging in certain "proprietary trading" activities, subject to exceptions for underwriting, market-making, risk-mitigating hedging and certain other activities. In addition, the Volcker Rule limits the sponsorship of, and investment in, "covered funds" (as defined by the Volcker Rule) and imposes limits on certain transactions between JPMorgan Chase and its sponsored funds (see JPMorgan Chase's subsidiary banks – Restrictions on transactions with affiliates below). The period during which banking entities were required to bring covered funds into conformance with the Volcker Rule ended on July 21, 2017. The Volcker Rule requires banking entities to establish comprehensive compliance programs reasonably designed to help ensure and monitor compliance with the restrictions under the Volcker Rule, including, in order to distinguish permissible from impermissible risk-taking activities, the measurement, monitoring and reporting of certain key metrics.

Capital and liquidity requirements. The Federal Reserve establishes capital and leverage requirements for JPMorgan Chase and evaluates its compliance with such requirements. The OCC establishes similar capital and leverage requirements for JPMorgan Chase's national banking subsidiaries. Under Basel III, bank holding companies and banks are required to measure their liquidity against two specific liquidity tests: the liquidity coverage ratio ("LCR") and the net stable funding ratio ("NSFR"). In the U.S., the final LCR rule ("U.S. LCR") became effective on January 1, 2015. In April 2016, the U.S. banking regulators issued a proposed rule for NSFR, but no final rule has been issued. On December 19, 2016, the Federal Reserve published final U.S. LCR public disclosure requirements. Beginning in the second quarter of 2017, JPMorgan Chase began disclosing its consolidated LCR pursuant to the U.S. LCR rule. On September 8, 2016, the Federal Reserve published the framework that will apply to the setting of the countercyclical capital buffer. The Federal Reserve reviews the amount of this buffer at least annually, and on December 1, 2017, the Federal Reserve reaffirmed setting this buffer at 0%. Banking supervisors globally continue to consider refinements and enhancements to the Basel III capital framework for financial institutions. On December 7, 2017, the Basel Committee issued Basel III: Finalizing post-crisis reforms ("Basel III Reforms"), which seeks to reduce excessive variability in RWA and converge capital requirements between Standardized and Advanced approaches. The Basel III Reforms include revisions to both the standardized and internal ratings-based approach for credit risk, streamlining of the available approaches under the credit valuation adjustment ("CVA") framework, a revised approach for operational risk, revisions to the measurement and calibration of the leverage ratio, and a capital floor based on 72.5% of the revised Standardized approaches. The Basel Committee expects national regulatory authorities to implement the Basel III Reforms in the laws of their respective jurisdictions and to require banking organizations subject to such laws to meet most of the revised requirements by January 1, 2022, with certain elements being phased in through January 1, 2027. U.S. banking regulators will now propose requirements applicable to U.S. financial institutions.

Stress tests. The Federal Reserve has adopted supervisory stress tests for large bank holding companies, including JPMorgan Chase, which form part of the Federal Reserve's annual Comprehensive Capital Analysis and Review ("CCAR") framework. Under the framework, JPMorgan Chase must conduct semi-annual company-run stress tests and, in addition, must submit an annual capital plan to the Federal Reserve, taking into account the results of separate stress tests designed by JPMorgan Chase and the Federal Reserve. In reviewing JPMorgan Chase's capital plan, the Federal Reserve considers both quantitative and qualitative factors. Qualitative assessments include, among other things, the comprehensiveness of the plan, the assumptions and analysis underlying the plan, and the extent to which JPMorgan Chase has satisfied certain supervisory matters related to JPMorgan Chase's processes and analyses, including the design and operational effectiveness of the controls governing such processes. Moreover, JPMorgan Chase is required to receive a notice of non-objection from the Federal Reserve before taking capital actions, such as paying dividends, implementing common equity repurchase programs or redeeming or repurchasing capital instruments. The OCC requires JPMorgan Chase Bank, N.A. to perform separate, similar annual stress tests. JPMorgan Chase publishes each year the results of its mid-cycle stress tests under JPMorgan Chase's internally-developed "severely adverse" scenario and the results of its (and its two primary subsidiary banks') annual stress tests under the supervisory "severely adverse" scenarios provided by the Federal Reserve and the OCC. JPMorgan Chase is required to file its 2018 annual CCAR submission on April 5, 2018. Results will be published by the Federal Reserve by June 30, 2018, with disclosures of results by BHCs, including JPMorgan Chase, to follow within 15 days. The mid-cycle capital stress test submissions are due on October 5, 2018 and BHCs, including JPMorgan Chase, will publish results by November 4, 2018. In December 2017, the Federal Reserve released a set of proposals intended to provide more detailed disclosure and transparency concerning the Federal Reserve's approach, design and governance of the supervisory stress testing process. The proposals were open for public comment through January 22, 2018.

Enhanced prudential standards. The Financial Stability Oversight Council ("FSOC"), among other things, recommends prudential standards and reporting and disclosure requirements to the Federal Reserve for systemically important financial institutions ("SIFIs"), such as JPMorgan Chase. The Federal Reserve has adopted several rules to implement the heightened prudential standards, including final rules relating to risk management and corporate governance of subject BHCs. BHCs with $50 billion or more in total consolidated assets are required to comply with enhanced liquidity and overall risk management standards, and their boards of directors are required to conduct appropriate oversight of their risk management activities.

Orderly liquidation authority and resolution and recovery. The FDIC requires each insured depository institution ("IDI") with $50 billion or more in assets, such as JPMorgan Chase Bank, N.A. and Chase Bank USA, N.A., to provide an IDI resolution plan.

In addition, as a BHC with assets of $50 billion or more, JPMorgan Chase is required to submit periodically to the Federal Reserve and the FDIC a plan for resolution under the Bankruptcy Code in the event of material distress or failure (a "resolution plan"). On December 19, 2017, the Federal Reserve and the FDIC announced joint determinations on the 2017 resolution plans of eight systemically important domestic banking institutions, including that of JPMorgan Chase, and extended the filing deadline for the next resolution plan for each of these entities until July 1, 2019. The agencies determined that JPMorgan Chase's 2017 resolution plan did not have any "deficiencies," which are weaknesses severe enough to trigger a resubmission process that could result in more stringent requirements, or any "shortcomings," which are less-severe weaknesses that would need to be addressed in the next resolution plan.

Certain financial companies, including JPMorgan Chase and certain of its subsidiaries, can also be subjected to resolution under an "orderly liquidation authority." The U.S. Treasury Secretary, in consultation with the President of the United States, must first make certain extraordinary financial distress and systemic risk determinations, and action must be recommended by the FDIC and the Federal Reserve. Absent such actions, JPMorgan Chase, as a BHC, would remain subject to resolution under the Bankruptcy Code. In December 2013, the FDIC issued a draft policy statement describing its "single point of entry" strategy for resolution of systemically important financial institutions under the orderly liquidation authority. This strategy seeks to keep operating subsidiaries of the BHC open and impose losses on shareholders and creditors of the holding company in receivership according to their statutory order of priority.

The OCC has published guidelines establishing standards for recovery planning by insured national banks, and JPMorgan Chase Bank, N.A. and Chase Bank USA, N.A. have submitted their recovery plans to the OCC. In addition, certain of JPMorgan Chase's non-U.S. subsidiaries are subject to resolution and recovery planning requirements in the jurisdictions in which they operate.

Regulators in the U.S. and abroad have proposed and implemented measures designed to address the possibility or perception that large financial institutions, including JPMorgan Chase, may be "too big to fail," and to provide safeguards so that, if a large financial institution does fail, it can be resolved without the use of public funds. Higher capital surcharges on global systemically important banks ("GSIBs"), requirements for certain large bank holding companies to maintain a minimum amount of long-term debt to facilitate orderly resolution of those firms (referred to as Total Loss Absorbing Capacity ("TLAC")), and the International Swaps and Derivatives Association ("ISDA") protocol relating to the "close-out" of derivatives transactions during the resolution of a large cross-border financial institution, are examples of initiatives to address "too big to fail." For further information on the ISDA close-out protocol, see Derivatives regulation below.

Holding company as source of strength for bank subsidiaries. JPMorgan Chase & Co. is required to serve as a source of financial strength for its depository institution subsidiaries and to commit resources to support those subsidiaries. This support may be required by the Federal Reserve at times when JPMorgan Chase might otherwise determine not to provide it.

Regulation of acquisitions. Acquisitions by bank holding companies and their banks are subject to multiple requirements by the Federal Reserve and the OCC. For example, financial holding companies and bank holding companies are required to obtain the approval of the Federal Reserve before they may acquire more than 5% of the voting shares of an unaffiliated bank. In addition, acquisitions by financial companies are prohibited if, as a result of the acquisition, the total liabilities of the financial company would exceed 10% of the total liabilities of all financial companies. In addition, for certain acquisitions, JPMorgan Chase must provide written notice to the Federal Reserve prior to acquiring direct or indirect ownership or control of any voting shares of any company with over $10 billion in assets that is engaged in activities that are "financial in nature."

JPMorgan Chase's subsidiary banks:
JPMorgan Chase's two principal subsidiary banks, JPMorgan Chase Bank, N.A. and Chase Bank USA, N.A., are FDIC-insured national banks regulated by the OCC. As national banks, the activities of JPMorgan Chase Bank, N.A. and Chase Bank USA, N.A. are limited to those specifically authorized under the National Bank Act and related interpretations by the OCC.

FDIC deposit insurance. The FDIC deposit insurance fund provides insurance coverage for certain deposits and is funded through assessments on banks, such as JPMorgan Chase Bank, N.A. and Chase Bank USA, N.A. Changes in the methodology used to calculate such assessments, resulting from the enactment of the Dodd-Frank Act, significantly increased the assessments that JPMorgan Chase's bank subsidiaries pay annually to the FDIC. The FDIC instituted a new assessment surcharge on insured depository institutions with total consolidated assets greater than $10 billion in order to raise the reserve ratio for the FDIC deposit insurance fund.

FDIC powers upon a bank insolvency. Upon the insolvency of an insured depository institution, such as JPMorgan Chase Bank, N.A., the FDIC could be appointed as the conservator or receiver under the Federal Deposit Insurance Act ("FDIA"). The FDIC has broad powers to transfer any assets and liabilities without the approval of the institution's creditors.

Cross-guarantee. An FDIC-insured depository institution can be held liable for any loss incurred or expected to be incurred by the FDIC if another FDIC-insured institution that is under common control with such institution is in default or is deemed to be "in danger of default" (commonly referred to as "cross-guarantee" liability). An FDIC cross-guarantee claim against a depository institution is generally superior in right of payment to claims of the holding company and its affiliates against such depository institution.

Prompt corrective action and early remediation. The Federal Deposit Insurance Corporation Improvement Act of 1991 requires the relevant federal banking regulator to take "prompt corrective action" with respect to a depository institution if that institution does not meet certain capital adequacy standards. While these regulations apply only to banks, such as JPMorgan Chase Bank, N.A. and Chase Bank USA, N.A., the Federal Reserve is authorized to take appropriate action against the parent BHC, such as JPMorgan Chase & Co., based on the undercapitalized status of any bank subsidiary. In certain instances, the BHC would be required to guarantee the performance of the capital restoration plan for its undercapitalized subsidiary.

OCC Heightened Standards. The OCC has established guidelines setting forth heightened standards for large banks. The guidelines establish minimum standards for the design and implementation of a risk governance framework for banks. While the bank can use certain components of the parent company's risk governance framework, the framework must ensure that the bank's risk profile is easily distinguished and separate from the parent for risk management purposes. The bank's board or risk committee is responsible for approving the bank's risk governance framework, providing active oversight of the bank's risk-taking activities, and holding management accountable for adhering to the risk governance framework.

Restrictions on transactions with affiliates. The bank subsidiaries of JPMorgan Chase (including subsidiaries of those banks) are subject to certain restrictions imposed by federal law on extensions of credit to, investments in stock or securities of, and derivatives, securities lending and certain other transactions with, JPMorgan Chase & Co. and certain other affiliates. These restrictions prevent JPMorgan Chase & Co. and other affiliates from borrowing from such subsidiaries unless the loans are secured in specified amounts and comply with certain other requirements. For more information, see Note 24. In addition, the Volcker Rule imposes a prohibition on such transactions between any JPMorgan Chase entity and covered funds for which a JPMorgan Chase entity serves as the investment manager, investment advisor, commodity trading advisor or sponsor, as well as, subject to a limited exception, any covered fund controlled by such funds.

Dividend restrictions. Federal law imposes limitations on the payment of dividends by national banks, such as JPMorgan Chase Bank, N.A. See Note 23 for the amount of dividends that JPMorgan Chase Bank, N.A. could pay, at January 1, 2018, to JPMorgan Chase without the approval of its banking regulators.

In addition to the dividend restrictions described above, the OCC and the Federal Reserve have authority to prohibit or limit the payment of dividends of the bank subsidiaries they supervise, if, in the banking regulator's opinion, payment of a dividend would constitute an unsafe or unsound practice in light of the financial condition of the bank.

Depositor preference. Under federal law, the claims of a receiver of an insured depository institution for administrative expense and the claims of holders of U.S. deposit liabilities (including the FDIC and deposits in non-U.S. branches that are dually payable in the U.S. and in a non-U.S. branch) have priority over the claims of other unsecured creditors of the institution, including public noteholders and depositors in non-U.S. branches. As a result, such persons could receive substantially less than the depositors in U.S. offices of the depository institution.

CFPB regulation and supervision, and other consumer regulations. JPMorgan Chase and its national bank subsidiaries, including JPMorgan Chase Bank, N.A. and Chase Bank USA, N.A., are subject to supervision and regulation by the CFPB with respect to federal consumer protection laws, including laws relating to fair lending and the prohibition of unfair, deceptive or abusive acts or practices in connection with the offer, sale or provision of consumer financial products and services. These laws include the Truth-in-Lending, Equal Credit Opportunity Act ("ECOA"), Fair Credit Reporting, Fair Debt Collection Practice, Electronic Funds Transfer, Credit Card Accountability, Responsibility and Disclosure ("CARD") and Home Mortgage Disclosure Acts. The CFPB has authority to impose new disclosure requirements for certain consumer financial products and services. The CFPB's rule-making efforts have addressed mortgage-related topics, including ability to repay and qualified mortgage standards, mortgage servicing standards, loan originator compensation standards, high-cost mortgage requirements, Home Mortgage Disclosure Act requirements, appraisal and escrow standards and requirements for higher-priced mortgages. The CFPB continues to issue informal guidance on a variety of topics (such as the collection of consumer debts and credit card marketing practices). Other areas of focus include sales incentives, pre-authorized electronic funds transfers, "add-on" products, matters involving consumer populations considered vulnerable by the CFPB, credit reporting, and the furnishing of credit scores to individuals. As part of its regulatory oversight, the CFPB has authority to take enforcement actions against firms that offer certain products and services to consumers, including JPMorgan Chase.

Securities and broker-dealer regulation:
JPMorgan Chase conducts securities underwriting, dealing and brokerage activities in the U.S. through J.P. Morgan Securities LLC and other non-bank broker-dealer subsidiaries, all of which are subject to regulations of the SEC, the Financial Industry Regulatory Authority and the New York Stock Exchange, among others. JPMorgan Chase conducts similar securities activities outside the U.S. subject to local regulatory requirements. In the U.K., those activities are conducted by J.P. Morgan Securities plc, a subsidiary of JPMorgan Chase Bank, N.A., and are regulated by the PRA and the FCA. Broker-dealers are subject to laws and regulations covering all aspects of the securities business, including sales and trading practices, securities offerings, publication of research reports, use of customers' funds, the financing of clients' purchases, capital structure, record-keeping and retention, and the conduct of their directors, officers and employees. In addition, rules adopted by the U.S. Department of Labor ("DOL") have imposed (among other things) a new standard of care applicable to broker-dealers when dealing with customers. For more information see Investment management regulation below.

Investment management regulation:
JPMorgan Chase's asset and wealth management businesses are subject to significant regulation in numerous jurisdictions around the world relating to, among other things, the safeguarding and management of client assets, offerings of funds and marketing activities. Certain of JPMorgan Chase's subsidiaries are registered with, and subject to oversight by, the SEC as investment advisers. As such, JPMorgan Chase's registered investment advisers are subject to the fiduciary and other obligations imposed under the Investment Advisers Act of 1940 and the rules and regulations promulgated thereunder, as well as various state securities laws. For information regarding investigations and litigation in connection with disclosures to clients related to proprietary products, see Note 27.

JPMorgan Chase's asset and wealth management businesses continue to be affected by ongoing rule-making and implementation of new regulations. The DOL's fiduciary rule, which became effective June 9, 2017, has significantly expanded the universe of persons viewed as investment advice fiduciaries to retirement plans and individual retirement accounts ("IRAs") under the Employee Retirement Income Security Act of 1974, as amended ("ERISA"). The prohibited transaction exemptions issued in connection with the rule require adherence to "impartial conduct standards" (including a requirement to act in the "best interest" of retirement clients), although compliance with requirements relating to conditions requiring new client contracts, implementation of policies and procedures, websites and other disclosures to both investors and the DOL have been delayed until July 1, 2019. Furthermore, the DOL is performing a review of the rule and the related exemptions in accordance with a February 2017 memorandum from the President. Subject to the outcome of the DOL's review, it is expected that the rule and related prohibited transaction exemptions will have a significant impact on the fee and compensation practices at financial institutions that offer investment advice to retail retirement clients. In addition to the impact of the DOL's fiduciary rule, JPMorgan Chase's asset and wealth management businesses may be affected by ongoing rule-making and implementation of new regulations by the SEC and certain U.S. states relating to enhanced standards of conduct for broker-dealers and certain other market participants.

In the European Union ("EU"), substantial revisions to the Markets in Financial Instruments Directive ("MiFID II") became effective across EU member states beginning January 3, 2018. These revisions introduced expanded requirements for a broad range of investment management activities, including product governance, transparency on costs and charges, independent investment advice, inducements, record keeping and client reporting. In addition, final regulations on European Money Market Fund Reform were published in July 2017 and, following an 18-month transition period for existing funds, will implement new requirements to enhance the liquidity and stability of money market funds in the EU.

Derivatives regulation:
JPMorgan Chase is subject to comprehensive regulation of its derivatives businesses. The regulations impose capital and margin requirements (including the collecting and posting of variation margin and initial margin in respect of non-centrally cleared derivatives), require central clearing of standardized over-the-counter ("OTC") derivatives, require that certain standardized over-the-counter swaps be traded on regulated trading venues, and provide for reporting of certain mandated information. In addition, the Dodd-Frank Act requires the registration of "swap dealers" and "major swap participants" with the CFTC and of "security-based swap dealers" and "major security-based swap participants" with the SEC. JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLC, J.P. Morgan Securities plc and J.P. Morgan Ventures Energy Corporation have registered with the CFTC as swap dealers, and JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLC and J.P. Morgan Securities plc may be required to register with the SEC as security-based swap dealers. As a result of their registration as swap dealers or security-based swap dealers, these entities will be subject to a comprehensive regulatory framework applicable to their swap or security-based swap activities, which includes capital requirements, rules regulating their swap activities, rules requiring the collateralization of uncleared swaps, rules regarding segregation of counterparty collateral, business conduct and documentation standards, record-keeping and reporting obligations, and anti-fraud and anti-manipulation requirements. Further, some of the rules for derivatives apply extraterritorially to U.S. firms doing business with

clients outside of the U.S., as well as to the overseas activities of non-U.S. subsidiaries of JPMorgan Chase that either deal with U.S. persons or that are guaranteed by U.S. subsidiaries of JPMorgan Chase; however, the full scope of the extra-territorial impact of the U.S. swaps regulation has not been finalized and therefore remains unclear. The effect of these rules may require banking entities, such as JPMorgan Chase, to modify the structure of their derivatives businesses and face increased operational and regulatory costs. In the EU, the implementation of the European Market Infrastructure Regulation ("EMIR") and MiFID II will result in comparable, but not identical, changes to the European regulatory regime for derivatives. The combined effect of the U.S. and EU requirements, and the potential conflicts and inconsistencies between them, present challenges and risks to the structure and operating model of JPMorgan Chase's derivatives businesses.

JPMorgan Chase and other financial institutions have agreed to adhere to the 2015 Universal Resolution Stay Protocol (the "Protocol") developed by ISDA in response to regulator concerns that the close-out of derivatives and other financial transactions during the resolution of a large cross-border financial institution could impede resolution efforts and potentially destabilize markets. The Protocol provides for the contractual recognition of cross-border stays under various statutory resolution regimes and a contractual stay on certain cross-default rights.

In the U.S., one subsidiary of JPMorgan Chase, J.P. Morgan Securities LLC, is registered as a futures commission merchant, and other subsidiaries are either registered with the CFTC as commodity pool operators and commodity trading advisors or are exempt from such registration. These CFTC-registered subsidiaries are also members of the National Futures Association.

Data regulation:

JPMorgan Chase and its subsidiaries are subject to federal, state and international laws and regulations concerning the use and protection of certain customer, employee and other personal and confidential information, including those imposed by the Gramm-Leach-Bliley Act and the Fair Credit Reporting Act, as well as the EU Data Protection Directive. In addition, various U.S. regulators, including the Federal Reserve, the OCC and the SEC, have increased their focus on cybersecurity and data privacy through guidance, examinations and regulations.

In May 2018, the General Data Protection Regulation ("GDPR") will replace the EU Data Protection Directive, and it will have a significant impact on how businesses can collect and process the personal data of EU individuals. In addition, numerous proposals regarding privacy and data protection are pending before U.S. and non-U.S. legislative and regulatory bodies.

The Bank Secrecy Act and Economic Sanctions:

The Bank Secrecy Act ("BSA") requires all financial institutions, including banks and securities broker-dealers, to, among other things, establish a risk-based system of internal controls reasonably designed to prevent money laundering and the financing of terrorism. The BSA includes a variety of record-keeping and reporting requirements (such as cash transaction and suspicious activity reporting), as well as due diligence/know your customer documentation requirements. In January 2013, JPMorgan Chase entered into Consent Orders with its banking regulators relating to JPMorgan Chase's Bank Secrecy Act/ Anti-Money Laundering policies, procedures and controls; JPMorgan Chase has taken significant steps to modify and enhance its processes and controls with respect to its Anti-Money Laundering procedures and to remediate the issues identified in the Consent Order. JPMorgan Chase is also subject to the regulations and economic sanctions programs administered by the U.S. Treasury's Office of Foreign Assets Control ("OFAC").

Anti-Corruption:

JPMorgan Chase is subject to laws and regulations relating to corrupt and illegal payments to government officials and others in the jurisdictions in which it operates, including the U.S. Foreign Corrupt Practices Act and the U.K. Bribery Act. In November 2016, JPMorgan Chase entered into a Consent Order with the Federal Reserve to resolve its investigation relating to a former hiring program for candidates referred by clients, potential clients and government officials in the Asia Pacific region. JPMorgan Chase has taken significant steps to modify and enhance its processes and controls with respect to the hiring of referred candidates and to remediate the issues identified in the Consent Order.

Compensation practices:

JPMorgan Chase's compensation practices are subject to oversight by the Federal Reserve, as well as other agencies. The Federal Reserve has issued guidance jointly with the FDIC and the OCC that is designed to ensure that incentive compensation paid by banking organizations does not encourage imprudent risk-taking that threatens the organizations' safety and soundness. In addition, under the Dodd-Frank Act, federal regulators, including the Federal Reserve, must issue regulations or guidelines requiring covered financial institutions, including JPMorgan Chase, to report the structure of all incentive-based compensation arrangements and prohibit incentive-based payment arrangements that encourage inappropriate risks by providing compensation that is excessive or that could lead to material financial loss to the institution. The Federal Reserve has conducted a review of the incentive compensation policies and practices of a number of large banking institutions, including JPMorgan Chase. The Financial Stability Board has established standards covering compensation principles for banks. In addition, the SEC has issued regulations that will require public companies to begin to disclose the pay ratio between the company's median employee and the company's chief executive officer or other principal executive officer in the proxy statement for the 2018 annual meeting of shareholders. JPMorgan Chase's compensation practices are also subject to regulation and oversight by local regulators in other jurisdictions. In Europe, the Fourth Capital Requirements Directive ("CRD IV") includes compensation provisions and the European Banking Authority has instituted guidelines on compensation policies which in certain countries, such as the U.K., are implemented or supplemented by further local regulations or guidelines. The implementation of the Federal Reserve's and other banking regulators' guidelines regarding compensation are expected to evolve over the next several years, and may affect the manner in which JPMorgan Chase structures its compensation programs and practices.

Significant international regulatory initiatives:
In the EU, there is an extensive and complex program of final and proposed regulatory enhancement that reflects, in part, the EU's commitments to policies of the Group of Twenty Finance Ministers and Central Bank Governors ("G20") together with other plans specific to the EU. The EU operates a European Systemic Risk Board that monitors financial stability, together with European Supervisory Authorities ("ESA") that set detailed regulatory rules and encourage supervisory convergence across the EU's Member States. The EU is currently reviewing the ESA framework. The EU has also created a Single Supervisory Mechanism for the euro-zone, under which the regulation of all banks in that zone will be under the auspices of the European Central Bank, together with a Single Resolution Mechanism and Single Resolution Board, having jurisdiction over bank resolution in the zone. At both the G20 and EU levels, various proposals are under consideration to address risks associated with global financial institutions.

In the EU, this includes EMIR, which requires, among other things, the central clearing of certain standardized derivatives and risk mitigation for uncleared OTC derivatives, and MiFID II, which gives effect to the G20 commitment to move trading of standardized OTC derivatives to exchanges or electronic trading platforms. MiFID II significantly enhances requirements for pre- and post-trade transparency, transaction reporting and investor protection. MiFID II also introduces a commodities position limits and reporting regime. EMIR became effective in 2012, although some requirements apply on a phased basis and certain aspects of the regulation are currently being reviewed. MiFID II became effective across EU Member States on January 3, 2018, after a one-year delay.

The EU is also currently considering or implementing significant revisions to laws covering securities settlement; mutual funds and pensions; payments; anti-money laundering controls; data security and privacy; transparency and disclosure of securities financing transactions; benchmarks; resolution of banks, investment firms and market infrastructures; and capital and liquidity requirements for banks and investment firms. The capital and liquidity legislation for banks and investment firms will implement in the EU many of the finalized Basel III capital and liquidity standards, including in relation to the leverage ratio, market risk capital, and a net stable funding ratio. The legislation also proposes an intermediate parent undertaking ("IPU") requirement for foreign banks, which will require non-EU banks operating in Europe (with total EU assets greater than EUR30 billion or which are part of a GSIB) to establish a single EU-located IPU. The full impact of the proposal on JPM's EU operations and legal entities will be heavily influenced by the outcome of the EU legislative process, including whether any flexibility is introduced to the requirement.

Consistent with the G20 and EU policy frameworks, U.K. regulators have adopted a range of policy measures that have significantly changed the markets and prudential regulatory environment in the U.K. In addition, U.K. regulators have introduced measures to enhance accountability of individuals, and promote forward-looking conduct risk identification and mitigation, including by introducing the Senior Managers and Certification Regimes.

On June 23, 2016, the U.K. voted by referendum to leave the European Union. The U.K. government invoked Article 50 of the Lisbon Treaty on March 29, 2017, starting a two-year period for the formal exit negotiations. This means that the U.K. will leave the EU on March 29, 2019 unless the timeline is unanimously extended by the remaining 27 EU Member States ("EU27") and the U.K. In December 2017, the EU27 agreed that "sufficient progress" had been made on the terms of the U.K.'s withdrawal to allow parallel talks on the future relationship, which are expected to begin in March 2018. The U.K.'s priorities in negotiating the future relationship are to seek a bilateral free trade agreement with the EU27 that facilitates the "greatest possible access" to the Single Market. However, the U.K. will not seek to continue its membership in the Single Market. The current EU27 position is that a free trade agreement should be balanced, ambitious and wide-ranging, that the U.K.'s participation in the Single Market or parts thereof must end, and that there will not be any sector-specific carve-outs, such as for financial services. Both the EU27 and the U.K. are open to the idea of a "transitional arrangement." The U.K.'s departure from the EU will have a significant impact across JPMorgan Chase's European businesses, including business and legal entity reorganization, and may lead to direct and indirect changes to EU27 and U.K. regulatory approaches. The situation remains highly uncertain, particularly in relation to whether a transition period is implemented and whether financial services will be included in any future free trade agreement.

Consolidation
The Consolidated Financial Statements include the accounts of JPMorgan Chase Bank, N.A. and other entities in which JPMorgan Chase Bank, N.A. has a controlling financial interest. All material intercompany balances and transactions have been eliminated.

Assets held for clients in an agency or fiduciary capacity by JPMorgan Chase Bank, N.A. are not assets of JPMorgan Chase Bank, N.A. and are not included on the Consolidated balance sheets.

JPMorgan Chase Bank, N.A. 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.

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, JPMorgan Chase Bank, N.A.'s determination of whether it has a controlling interest is primarily based on the amount of voting equity interests held. Entities in which JPMorgan Chase Bank, N.A. has a controlling financial interest, through ownership of the majority of the entities' voting equity interests, or through other contractual rights that give JPMorgan Chase Bank, N.A. control, are consolidated by JPMorgan Chase Bank, N.A.

Investments in companies in which JPMorgan Chase Bank, N.A. 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 JPMorgan Chase Bank, N.A. to recognize its proportionate share of the entity's net earnings), or (ii) at fair value if the fair value option was elected. These investments are generally included in other assets, with income or loss included in other income.

Certain JPMorgan Chase Bank, N.A.-sponsored asset management funds are structured as limited partnerships or certain limited liability companies. For many of these entities, JPMorgan Chase Bank, N.A. is a general partner or managing member, but the non-affiliated partners or members have the ability to remove JPMorgan Chase Bank, N.A as the general partner or managing member without cause (i.e., kick-out rights), based on a simple majority vote, or the non-affiliated partners or members have rights to participate in important decisions. Accordingly, JPMorgan Chase Bank, N.A. does not consolidate these voting interest entities. However, in the limited cases where the non-managing partners or members do not have substantive kick-out or participating rights, JPMorgan Chase Bank, N.A. evaluates the funds as VIEs and consolidates if it is the general partner or managing member and has a potentially significant interest.

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 JPMorgan Chase Bank, N.A. has the power to direct the activities of a VIE that most significantly impact the VIE's economic performance, JPMorgan Chase Bank, N.A. considers all the 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, or 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 JPMorgan Chase Bank, N.A. has the obligation to absorb losses of the VIE or the right to receive benefits from the VIE that could potentially be significant to the VIE, JPMorgan Chase Bank, N.A. considers all of its economic interests, including debt and equity investments, servicing fees, and derivatives or other arrangements deemed to be variable interests in the VIE. This assessment requires that JPMorgan Chase Bank, N.A. 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 across various classes within the VIE's capital structure; and the reasons why the interests are held by JPMorgan Chase Bank, N.A.

JPMorgan Chase Bank, N.A. performs on-going reassessments of: (1) whether entities previously evaluated under the majority voting-interest framework have become VIEs, based on certain events, and are therefore subject to the VIE consolidation framework; and (2) whether changes in the facts and circumstances regarding JPMorgan Chase Bank, N.A.'s involvement with a VIE cause JPMorgan Chase Bank, N.A.'s consolidation conclusion to change.

Use of estimates in the preparation of consolidated financial statements

The preparation of the Consolidated Financial Statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, revenue and expense, and disclosures of contingent assets and liabilities. Actual results could be different from these estimates.

Foreign currency translation

JPMorgan Chase Bank, N.A. revalues assets, liabilities, revenue and expense denominated in non-U.S. currencies into U.S. dollars using applicable exchange rates.

Gains and losses relating to translating functional currency financial statements for U.S. reporting are included in other comprehensive income/(loss) ("OCI") within stockholder's equity. Gains and losses relating to nonfunctional currency transactions, including non-U.S. operations where the functional currency is the U.S. dollar, are reported in the Consolidated statements of income.

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 balance sheets when a legally enforceable master netting agreement exists. U.S. GAAP also permits securities sold and purchased under repurchase agreements and securities borrowed or loaned under securities loan agreements to be presented net when specified conditions are met, including the existence of a legally enforceable master netting agreement. JPMorgan Chase Bank, N.A. has elected to net such balances when the specified conditions are met.

JPMorgan Chase Bank, N.A. uses master netting agreements with third parties and affiliates to mitigate counterparty credit risk in certain transactions, including derivative, securities repurchase and reverse repurchase, and securities loaned and borrow transactions. A master netting agreement is a single agreement with a counterparty that permits multiple transactions governed by that agreement to be terminated or accelerated 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). Upon the exercise of derivatives termination rights by the non-defaulting party (i) all transactions are terminated, (ii) all transactions are valued and the positive values of "in the money" transactions are netted against the negative values of "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 default rights under repurchase agreements and securities loan agreements in general (i) all 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 JPMorgan Chase Bank, N.A.'s derivative instruments, see Note 6. For further discussion of JPMorgan Chase Bank, N.A.'s repurchase and reverse repurchase agreements, and securities borrowing and lending agreements, see Note 12.

Statements of cash flows

For JPMorgan Chase Bank, N.A.'s Consolidated statements of cash flows, cash is defined as those amounts included in cash and due from banks.

Significant accounting policies

The following table identifies JPMorgan Chase Bank, N.A.'s other significant accounting policies and the Note and page where a detailed description of each policy can be found.

Fair value measurement	Note 3	Page 20
Fair value option	Note 4	Page 38
Derivative instruments	Note 6	Page 43
Noninterest revenue	Note 7	Page 57
Interest income and interest expense	Note 8	Page 60
Pension and other postretirement employee benefit plans	Note 9	Page 61
Employee share-based incentives	Note 10	Page 65
Securities	Note 11	Page 67
Securities financing activities	Note 12	Page 72
Loans	Note 13	Page 75
Allowance for credit losses	Note 14	Page 95
Variable interest entities	Note 15	Page 100
Goodwill and Mortgage servicing rights	Note 16	Page 108
Premises and equipment	Note 17	Page 110
Long-term debt	Note 19	Page 111
Related party transactions	Note 20	Page 112
Income taxes	Note 22	Page 115
Off-balance sheet lending-related financial instruments, guarantees and other commitments	Note 25	Page 120
Litigation	Note 27	Page 127

Note 2 – ACCOUNTING AND REPORTING DEVELOPMENTS

SEC Staff Accounting Bulletin adopted during 2017

Bulletin	Summary of guidance	Effects on financial statements
Application of U.S. GAAP related to the Tax Cuts and Jobs Act ("TCJA") (SEC Staff Accounting Bulletin No. 118) *Issued December 2017*	• Provides guidance on the accounting for income taxes in the context of the TCJA. • For impacts of the tax law changes that are reasonably estimable, requires the recognition of provisional amounts in year-end 2017 financial statements. • Provides a 1-year measurement period in which to refine previously recorded provisional amounts based on new information or interpretations.	• The TCJA resulted in a $2.1 billion decrease in net income driven by a deemed repatriation charge and adjustments to the value of JPMorgan Chase Bank, N.A.'s tax oriented investments, partially offset by a benefit from the revaluation of JPMorgan Chase Bank, N.A.'s net deferred tax liability. Certain of these amounts may be refined in accordance with SEC Staff Accounting Bulletin No. 118. • Refer to Note 22 for additional information related to the impacts of the TCJA.

FASB Standards issued but not adopted as of December 31, 2017

Standard	Summary of guidance	Effects on financial statements
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 statements 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.	• Adopted January 1, 2018. • JPMorgan Chase Bank, N.A. adopted the revenue recognition guidance using the full retrospective method of adoption. • The adoption of the guidance did not result in any material changes in the timing or presentation of JPMorgan Chase Bank, N.A.'s revenue recognition. • JPMorgan Chase Bank, N.A.'s Note 7 qualitative disclosures are consistent with the guidance.
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. • Provides a measurement alternative for equity securities without readily determinable fair values to be measured at cost less impairment (if any), plus or minus observable price changes from an identical or similar investment of the same issuer. Any such price changes will be reflected in earnings beginning in the period of adoption. • Generally requires a cumulative-effect adjustment to retained earnings as of the beginning of the reporting period of adoption, except for those equity securities that are eligible for the measurement alternative.	• JPMorgan Chase Bank, N.A. early adopted the provisions of this guidance related to presenting DVA in OCI for financial liabilities where the fair value option has been elected, effective January 1, 2016. JPMorgan Chase Bank, N.A. adopted the portions of the guidance that were not eligible for early adoption on January 1, 2018. • Upon adoption, JPMorgan Chase Bank, N.A. elected the measurement alternative for its equity securities that do not have readily determinable fair values, and JPMorgan Chase Bank, N.A. did not record a cumulative-effect adjustment related to the adoption of this guidance.
Classification of certain cash receipts and cash payments in the 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. • Requires retrospective application to all periods presented.	• Adopted January 1, 2018. • No material impact upon adoption as JPMorgan Chase Bank, N.A. was either in compliance with the amendments or the amounts to which it is applied are immaterial.

FASB Standards issued but not adopted as of December 31, 2017 (continued)

Standard	Summary of guidance	Effects on financial statements
Treatment of restricted cash on the statement of cash flows *Issued November 2016*	• Requires inclusion of restricted cash in the cash and cash equivalents balances in the Consolidated statements of cash flows. • Requires additional disclosures to supplement the Consolidated statements of cash flows. • Requires retrospective application to all periods presented.	• Adopted January 1, 2018. • The adoption of the guidance will result in reclassification of restricted cash balances into Cash and restricted cash on the Consolidated statements of cash flows in the first half of 2018. JPMorgan Chase Bank, N.A. will include Cash and due from banks and Deposits with banks in Cash and restricted cash in the Consolidated statements of cash flows, resulting in Deposits with banks no longer being reflected in Investing activities. • In addition, to align with the presentation of Cash and restricted cash on the Consolidated statements of cash flows, JPMorgan Chase Bank, N.A. will reclassify restricted cash balances to Cash and due from banks and to Deposits with banks from Other assets and disclose the total for Cash and restricted cash on JPMorgan Chase Bank, N.A.'s Consolidated balance sheets in the first half of 2018.
Definition of a business *Issued January 2017*	• Narrows the definition of a business and clarifies that, to be considered a business, the fair value of the gross assets acquired (or disposed of) may not be substantially all concentrated in a single identifiable asset or a group of similar assets. • In addition, in order to be considered a business, a set of activities and assets must include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create outputs.	• Adopted January 1, 2018. • No impact upon adoption because the guidance is to be applied prospectively. Subsequent to adoption, fewer transactions will be treated as acquisitions or dispositions of a business.
Presentation of net periodic pension cost and net periodic postretirement benefit cost *Issued March 2017*	• Requires the service cost component of net periodic pension and postretirement benefit cost to be reported separately in the consolidated results of operations from the other components (e.g., expected return on assets, interest costs, amortization of gains/losses and prior service costs). • Requires retrospective application and presentation in the consolidated results of operations of the service cost component in the same line item as other employee compensation costs and presentation of the other components in a different line item from the service cost component.	• Adopted January 1, 2018. • The adoption of the guidance in the first quarter of 2018 will result in an increase in compensation expense and a reduction in other expense of $75 million and $78 million for the years ended December 31, 2017 and 2016, respectively.
Premium amortization on purchased callable debt securities *Issued March 2017*	• Requires amortization of premiums to the earliest call date on debt securities with call features that are explicit, noncontingent and callable at fixed prices and on preset dates. • Does not impact securities held at a discount; the discount continues to be amortized to the contractual maturity. • Requires adoption on a modified retrospective basis through a cumulative-effect adjustment directly to retained earnings as of the beginning of the period of adoption.	• JPMorgan Chase Bank, N.A. early adopted the new guidance on January 1, 2018. • The new guidance primarily impacts obligations of U.S. states and municipalities held in JPMorgan Chase Bank, N.A.'s investment securities portfolio. • The adoption of this guidance resulted in a cumulative-effect adjustment that reduced retained earnings by approximately $494 million as of January 1, 2018, with a corresponding increase of $252 million (after tax) in AOCI and related adjustments to securities and tax liabilities. • Subsequent to adoption, although the guidance will reduce the interest income recognized prior to the earliest call date for callable debt securities held at a premium, the effect of this guidance on JPMorgan Chase Bank, N.A.'s net interest income is not expected to be material.

FASB Standards issued but not adopted as of December 31, 2017 (continued)

Standard	Summary of guidance	Effects on financial statements
Hedge accounting *Issued August 2017*	• Reduces earnings volatility by better aligning the accounting with the economics of the risk management activities. • Expands the ability for certain hedges of interest rate risk to qualify for hedge accounting. • Allows recognition of ineffectiveness in cash flow hedges and net investment hedges in OCI. • Allows a one-time election at adoption to transfer certain securities classified as held-to-maturity to available-for-sale. • Simplifies hedge documentation requirements.	• JPMorgan Chase Bank, N.A. early adopted the new guidance on January 1, 2018. • The adoption of the guidance did not result in a material cumulative-effect adjustment to retained earnings and AOCI. • JPMorgan Chase Bank, N.A. will also amend its qualitative and quantitative disclosures within its derivative instruments note to the Consolidated Financial Statements in the first half of 2018. • In accordance with the new guidance, JPMorgan Chase Bank, N.A. elected to transfer certain securities from HTM to AFS. The amendments provide JPMorgan Chase Bank, N.A. with additional hedge accounting alternatives for its AFS securities (including those transferred under the election) to be considered as JPMorgan Chase Bank, N.A. manages it structural interest rate risk and regulatory capital. JPMorgan Chase Bank, N.A. is currently evaluating those risk management alternatives and intends to manage the transferred securities in a manner consistent with its existing AFS securities. This transfer is a non-cash transaction at fair value.
Reclassification of Certain Tax Effects from AOCI *Issued February 2018*	• Provides an election to reclassify from AOCI to retained earnings stranded tax effects due to the revaluation of deferred tax assets and liabilities as a result of changes in applicable tax rates under the TCJA. • Requires additional disclosures related to JPMorgan Chase Bank, N.A.'s election to reclassify amounts from AOCI to retained earnings and JPMorgan Chase Bank, N.A.'s policy for releasing income tax effects from AOCI. • The guidance is required to be applied retrospectively to each period (or periods) in which the effect of the change in the federal corporate income tax rate is recognized.	• JPMorgan Chase Bank, N.A. early adopted the new guidance on January 1, 2018. • The adoption of the guidance resulted in a cumulative-effect adjustment that decreased retained earnings in the amount of $186 million. This amount is an estimate that may be refined in accordance with SEC Staff Accounting Bulletin No. 118, and represents the removal of the stranded tax effects from AOCI, thereby allowing the tax effects within AOCI to reflect the new respective corporate income tax rate. • Refer to Note 22 for additional information related to the impacts of the TCJA.
Leases *Issued February 2016*	• Requires lessees to recognize all leases longer than twelve months on the Consolidated balance sheets 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. • Permits JPMorgan Chase Bank, N.A. to generally account for its existing leases consistent with current guidance, except for the incremental balance sheet recognition. • Expands qualitative and quantitative disclosures regarding leasing arrangements. • May be adopted using 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, 2019.[a] • JPMorgan Chase Bank, N.A. is in the process of its implementation which has included an initial evaluation of its leasing contracts and activities. As a lessee, JPMorgan Chase Bank, N.A. is developing its methodology to estimate the right-of-use assets and lease liabilities, which is based on the present value of lease payments. JPMorgan Chase Bank, N.A. expects to recognize lease liabilities and corresponding right-of-use assets (at their present value) related to predominantly all of the $9 billion of future minimum payments required under operating leases as disclosed in Note 26. However, the population of contracts subject to balance sheet recognition and their initial measurement remains under evaluation. JPMorgan Chase Bank, N.A. does not expect material changes to the recognition of operating lease expense in its Consolidated statements of income. • JPMorgan Chase Bank, N.A. plans to adopt the new guidance in the first quarter of 2019.

FASB Standards issued but not adopted as of December 31, 2017 (continued)

Standard	Summary of guidance	Effects on financial statements
Financial instruments – credit losses *Issued June 2016*	• Replaces existing incurred loss impairment guidance and establishes a single allowance framework for financial assets carried at amortized cost (including Held-to-maturity ("HTM") securities), which will reflect management's estimate of credit losses over the full remaining expected life of the financial assets. • Eliminates existing guidance for PCI loans, and requires recognition of an allowance for expected credit losses on financial assets purchased with more than insignificant credit deterioration since origination. • Amends existing impairment guidance for AFS securities to incorporate an allowance, which will allow for reversals of impairment losses in the event that the credit of an issuer improves. • Requires a cumulative-effect adjustment to retained earnings as of the beginning of the reporting period of adoption.	• Required effective date: January 1, 2020.[(a)] • JPMorgan Chase Bank, N.A. has begun its implementation efforts by establishing a Firmwide, cross-discipline governance structure. JPMorgan Chase Bank, N.A. is currently identifying key interpretive issues, and is assessing existing credit loss forecasting models and processes against the new guidance to determine what modifications may be required. • JPMorgan Chase Bank, N.A. expects that the new guidance will result in an increase in its allowance for credit losses due to several factors, including: 1. The allowance related to JPMorgan Chase Bank, N.A.'s loans and commitments will increase to cover credit losses over the full remaining expected life of the portfolio, and will consider expected future changes in macroeconomic conditions 2. The nonaccretable difference on PCI loans will be recognized as an allowance, offset by an increase in the carrying value of the related loans 3. An allowance will be established for estimated credit losses on HTM securities • The extent of the increase is under evaluation, but will depend upon the nature and characteristics of JPMorgan Chase Bank, N.A.'s portfolio at the adoption date, and the macroeconomic conditions and forecasts at that date.
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, JPMorgan Chase Bank, N.A. does not expect a material effect on the Consolidated Financial Statements. • After adoption, the guidance may result in more frequent goodwill impairment losses due to the removal of the second condition. • JPMorgan Chase Bank, N.A. is evaluating the timing of adoption.

(a) Early adoption is permitted.

Note 3 – Fair value measurement

JPMorgan Chase Bank, N.A. carries a portion of its assets and liabilities at fair value. These assets and liabilities are predominantly carried at fair value on a recurring basis (i.e., assets and liabilities that are measured and reported at fair value on JPMorgan Chase Bank, N.A.'s Consolidated balance sheets). Certain assets (e.g., held-for-sale loans), liabilities and unfunded lending-related commitments are measured at fair value on a nonrecurring basis; that is, they are not measured at fair value on an ongoing basis but are subject to fair value adjustments only in certain circumstances (for example, when there is evidence of impairment).

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 valuation models and other valuation techniques that consider relevant transaction characteristics (such as maturity) and use as inputs observable or unobservable market parameters, including 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 JPMorgan Chase Bank, N.A. 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 JPMorgan Chase Bank, N.A.'s businesses and portfolios.

JPMorgan Chase Bank, N.A. 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 JPMorgan Chase Bank, N.A. could result in JPMorgan Chase Bank, N.A. deriving 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 balance sheets 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 JPMorgan Chase Bank, N.A.'s positions are recorded at fair value. The 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 Firmwide head of the VCG (under the direction of JPMorgan Chase's Controller).

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, the VCG performs additional review to ensure the reasonableness of the estimates. The additional review may include evaluating the limited market activity including client unwinds, benchmarking valuation inputs to those used 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 to quoted prices 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 Bank, N.A.:

- 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.
- JPMorgan Chase Bank, N.A. 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, JPMorgan Chase Bank, N.A.also applies adjustments to its estimates of fair value in order to appropriately reflect counterparty credit quality (credit valuation adjustments (“CVA”)), JPMorgan Chase Bank, N.A.’s own creditworthiness (debit valuation adjustments (“DVA”)) and the impact of funding (funding valuation adjustments (“FVA”)), using a consistent framework across JPMorgan Chase Bank, N.A.

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.

Under JPMorgan Chase Bank, N.A.’s Estimations and Model Risk Management Policy, 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 JPMorgan Chase Bank, N.A.’s 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. These actions will depend on the model and may include, for example, limitation of trading activity.

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 table describes the valuation methodologies generally used by JPMorgan Chase Bank, N.A. to measure its 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 characteristics	Predominantly level 2
Loans and lending-related commitments – wholesale		
Loans carried at fair value (e.g. trading loans and non-trading loans) and associated lending-related commitments	Where observable market data is available, valuations are based on: • Observed market prices (circumstances are infrequent) • Relevant broker quotes • Observed market prices for similar instruments Where observable market data is unavailable or limited, valuations are based on discounted cash flows, which consider the following: • Credit spreads derived from the cost of credit default swaps ("CDS"); or benchmark credit curves developed by JPMorgan Chase Bank, N.A., by industry and credit rating • Prepayment speed • Collateral characteristics	Level 2 or 3
Loans held-for-investment and associated lending related commitments	Valuations are based on discounted cash flows, which consider: • Credit spreads, derived from the cost of CDS; or benchmark credit curves developed by JPMorgan Chase Bank, N.A., by industry and credit rating • Prepayment speed Lending-related commitments are valued similarly to loans and reflect the portion of an unused commitment expected, based on JPMorgan Chase Bank, N.A.'s average portfolio historical experience, to become funded prior to an obligor default. For information regarding the valuation of loans measured at collateral value, see Note 13.	Predominantly level 3
Loans – consumer		
Held-for-investment consumer loans, excluding credit card	Valuations are based on discounted cash flows, which consider: • Credit losses – which consider expected and current default rates, and loss severity • Prepayment speed • Discount rates • Servicing costs For information regarding the valuation of loans measured at collateral value, see Note 13.	Predominantly level 2
Held-for-investment credit card receivables	Valuations are based on discounted cash flows, which consider: • Credit costs - the allowance for loan losses is considered a reasonable proxy for the credit cost • Projected interest income, late-fee revenue and loan repayment rates • Discount rates • Servicing costs	Level 3
Trading loans – conforming residential mortgage loans expected to be sold (Consumer & community banking business, Corporate & investment banking business)	Fair value is based on observable prices for mortgage-backed securities ("MBS") with similar collateral and incorporates adjustments to these prices to account for differences between the securities and the value of the underlying loans, which include credit characteristics, portfolio composition, and liquidity.	Predominantly level 2

Product/instrument	Valuation methodology, inputs and assumptions	Classifications in the valuation hierarchy
Investment and trading securities	Quoted market prices are used where available.	Level 1
	In the absence of quoted market prices, securities are valued based on: • Observable market prices for similar securities • Relevant broker quotes • Discounted cash flows In addition, the following inputs to discounted cash flows are used for the following products: *Mortgage- and asset-backed securities ("ABS") 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
Physical commodities	Valued using observable market prices or data.	Predominantly Level 1 and 2
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 may use observable or unobservable valuation inputs as well as considering the contractual terms. The key valuation inputs used will depend on the type of derivative and the nature of the underlying instruments and may include equity prices, commodity prices, interest rate yield curves, foreign exchange rates, volatilities, correlations, CDS spreads and recovery rates. Additionally, the credit quality of the counterparty and of JPMorgan Chase Bank, N.A. as well as market funding levels may also be considered. In addition, specific inputs used for derivatives that are valued based on models with significant unobservable inputs are as follows: Structured credit derivatives specific inputs include: • CDS spreads and recovery rates • Credit correlation between the underlying debt instruments Equity option specific inputs include: • Equity volatilities • Equity correlation • Equity-FX correlation • Equity-IR correlation Interest rate and FX exotic options specific inputs include: • Interest rate spread volatility • Interest rate correlation • Foreign exchange correlation • Interest rate-FX correlation Commodity derivatives specific inputs include: • Commodity volatility • Forward commodity price Additionally, adjustments are made to reflect counterparty credit quality (CVA) and the impact of funding (FVA).	Level 2 or 3

Product/instrument	Valuation methodology, inputs and assumptions	Classification in the valuation hierarchy
Mortgage servicing rights ("MSRs")	See Mortgage servicing rights in Note 16.	Level 3
Fund investments (e.g. mutual/ collective investment funds, private equity funds, hedge funds, and real estate funds)	Net asset value ("NAV") • NAV is supported by the ability to redeem and purchase at the NAV level. • Adjustments to the NAV as required, for restrictions on redemption (e.g., lock-up periods or withdrawal limitations) or where observable activity is limited.	Level 1 Level 2 or 3[(a)]
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
Long-term debt, not carried at fair value	Valuations are based on discounted cash flows, which consider: • Market rates for respective maturity	Predominantly level 2
Structured notes (included in deposits, 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 may 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 derivatives valuation. Adjustments are then made to this base valuation to reflect JPMorgan Chase Bank, N.A.'s own credit risk (DVA).	Level 2 or 3

(a) Excludes certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient.

The following table presents the assets and liabilities reported at fair value as of December 31, 2017 and 2016 by major product category and fair value hierarchy.

Assets and liabilities measured at fair value on a recurring basis

	Fair value hierarchy				
December 31, 2017 (in millions)	Level 1	Level 2	Level 3	Derivative netting adjustments	Total fair value
Federal funds sold and securities purchased under resale agreements	$ –	$ 2,894	$ –	$ –	$ 2,894
Securities borrowed	–	3,049	–	–	3,049
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. government agencies[a]	–	2,981	289	–	3,270
Residential – nonagency	–	1,036	24	–	1,060
Commercial – nonagency	–	109	2	–	111
Total mortgage-backed securities	–	4,126	315	–	4,441
U.S. Treasury and government agencies[a]	4,254	–	1	–	4,255
Obligations of U.S. states and municipalities	–	4,285	15	–	4,300
Certificates of deposit, bankers' acceptances and commercial paper	–	38	–	–	38
Non-U.S. government debt securities	28,837	28,777	78	–	57,692
Corporate debt securities	–	16,310	191	–	16,501
Loans	–	35,079	2,332	–	37,411
Asset-backed securities	–	589	51	–	640
Total debt instruments	33,091	89,204	2,983	–	125,278
Equity securities	52,950	32	121	–	53,103
Physical commodities[b]	1,774	–	–	–	1,774
Other	–	14,039	350	–	14,389
Total debt and equity instruments[c]	87,815	103,275	3,454	–	194,544
Derivative receivables:					
Interest rate	68	317,904	1,911	(295,441)	24,442
Credit	–	20,987	1,208	(21,481)	714
Foreign exchange	851	159,842	580	(145,215)	16,058
Equity	–	51,183	6,323	(50,403)	7,103
Commodity	–	39,723	381	(33,796)	6,308
Total derivative receivables[d][e]	919	589,639	10,403	(546,336)	54,625
Total trading assets[f]	88,734	692,914	13,857	(546,336)	249,169
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. government agencies[a]	–	70,280	–	–	70,280
Residential – nonagency	–	11,366	1	–	11,367
Commercial – nonagency	–	4,880	–	–	4,880
Total mortgage-backed securities	–	86,526	1	–	86,527
U.S. Treasury and government agencies[a]	22,745	–	–	–	22,745
Obligations of U.S. states and municipalities	–	30,175	–	–	30,175
Certificates of deposit	–	59	–	–	59
Non-U.S. government debt securities	18,140	9,154	–	–	27,294
Corporate debt securities	–	2,757	–	–	2,757
Asset-backed securities:					
Collateralized loan obligations	–	20,720	276	–	20,996
Other	–	8,773	–	–	8,773
Equity securities	38	–	–	–	38
Total available-for-sale securities	40,923	158,164	277	–	199,364
Loans	–	2,232	276	–	2,508
Mortgage servicing rights	–	–	6,030	–	6,030
Other assets[f]	7,454	–	–	–	7,454
Total assets measured at fair value on a recurring basis	$ 137,111	$ 859,253	$ 20,440	$ (546,336)	$ 470,468
Deposits	$ –	$ 17,230	$ 4,150	$ –	$ 21,380
Federal funds purchased and securities loaned or sold under repurchase agreements	–	3,405	–	–	3,405
Short-term borrowings	–	3,973	1,604	–	5,577
Trading liabilities:					
Debt and equity instruments[c]	45,597	14,834	37	–	60,468
Derivative payables:					
Interest rate	54	288,043	1,653	(282,736)	7,014
Credit	–	21,026	1,241	(21,182)	1,085
Foreign exchange	826	154,952	1,021	(144,201)	12,598
Equity	–	54,976	8,210	(53,935)	9,251
Commodity	–	39,808	1,029	(34,516)	6,321
Total derivative payables[d][e]	880	558,805	13,154	(536,570)	36,269
Total trading liabilities	46,477	573,639	13,191	(536,570)	96,737
Accounts payable and other liabilities	7,454	–	–	–	7,454
Long-term debt	–	11,247	10,154	–	21,401
Total liabilities measured at fair value on a recurring basis	$ 53,931	$ 609,494	$ 29,099	$ (536,570)	$ 155,954

	Fair value hierarchy				
December 31, 2016 (in millions)	Level 1	Level 2	Level 3	Derivative netting adjustments	Total fair value
Federal funds sold and securities purchased under resale agreements	$ –	$ 5,349	$ –	$ –	$ 5,349
Securities borrowed	–	–	–	–	–
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. government agencies[(a)]	–	74	369	–	443
Residential – nonagency	–	818	11	–	829
Commercial – nonagency	–	89	6	–	95
Total mortgage-backed securities	–	981	386	–	1,367
U.S. Treasury and government agencies[(a)]	13,516	52	–	–	13,568
Obligations of U.S. states and municipalities	–	3,897	19	–	3,916
Certificates of deposit, bankers' acceptances and commercial paper	–	245	–	–	245
Non-U.S. government debt securities	28,443	22,994	46	–	51,483
Corporate debt securities	–	14,158	318	–	14,476
Loans	–	28,758	4,325	–	33,083
Asset-backed securities	–	696	70	–	766
Total debt instruments	41,959	71,781	5,164	–	118,904
Equity securities	51,480	19	89	–	51,588
Physical commodities[(b)]	1,102	–	–	–	1,102
Other	–	9,486	281	–	9,767
Total debt and equity instruments[(c)]	94,541	81,286	5,534	–	181,361
Derivative receivables:					
Interest rate	289	607,393	2,658	(582,320)	28,020
Credit	–	27,759	1,390	(27,916)	1,233
Foreign exchange	816	233,854	928	(212,279)	23,319
Equity	–	47,816	3,089	(45,879)	5,026
Commodity	158	34,774	358	(28,970)	6,320
Total derivative receivables[(d)]	1,263	951,596	8,423	(897,364)	63,918
Total trading assets[(f)]	95,804	1,032,882	13,957	(897,364)	245,279
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. government agencies[(a)]	–	64,005	–	–	64,005
Residential – nonagency	–	14,442	1	–	14,443
Commercial – nonagency	–	8,691	–	–	8,691
Total mortgage-backed securities	–	87,138	1	–	87,139
U.S. Treasury and government agencies[(a)]	44,072	29	–	–	44,101
Obligations of U.S. states and municipalities	–	28,897	–	–	28,897
Certificates of deposit	–	106	–	–	106
Non-U.S. government debt securities	22,793	12,495	–	–	35,288
Corporate debt securities	–	4,958	–	–	4,958
Asset-backed securities:					
Collateralized loan obligations	–	26,738	663	–	27,401
Other	–	6,926	–	–	6,926
Equity securities	54	–	–	–	54
Total available-for-sale securities	66,919	167,287	664	–	234,870
Loans	–	1,660	568	–	2,228
Mortgage servicing rights	–	–	6,096	–	6,096
Other assets[(f)]	–	–	41	–	41
Total assets measured at fair value on a recurring basis	$ 162,723	$ 1,207,178	$ 21,326	$ (897,364)	$ 493,863
Deposits	$ –	$ 11,844	$ 2,121	$ –	$ 13,965
Federal funds purchased and securities loaned or sold under repurchase agreements	–	399	–	–	399
Short-term borrowings	–	4,552	1,019	–	5,571
Trading liabilities:					
Debt and equity instruments[(c)]	50,393	12,636	36	–	63,065
Derivative payables:					
Interest rate	184	575,305	1,657	(566,601)	10,545
Credit	–	27,042	1,294	(27,038)	1,298
Foreign exchange	932	232,508	2,459	(215,433)	20,466
Equity	–	50,262	4,577	(46,307)	8,532
Commodity	173	34,773	323	(27,475)	7,794
Total derivative payables[(d)]	1,289	919,890	10,310	(882,854)	48,635
Total trading liabilities	51,682	932,526	10,346	(882,854)	111,700
Accounts payable and other liabilities	7,494	–	–	–	7,494
Long-term debt	–	7,274	7,662	–	14,936
Total liabilities measured at fair value on a recurring basis	$ 59,176	$ 956,595	$ 21,148	$ (882,854)	$ 154,065

(a) At December 31, 2017 and 2016, included total U.S. government-sponsored enterprise obligations of $49.1 billion and $46.3 billion, respectively, which were predominantly mortgage-related.
(b) Physical commodities inventories are generally accounted for at the lower of cost or net realizable value. "Net realizable value" is a term defined in U.S. GAAP as not exceeding fair value less costs to sell ("transaction costs"). Transaction costs for JPMorgan Chase Bank, N.A.'s physical commodities inventories are either not applicable or immaterial to the value of the inventory. Therefore, net realizable value approximates fair value for JPMorgan Chase Bank, N.A.'s physical commodities inventories. When fair value hedging has been applied (or when net realizable value is below cost), the carrying value of physical commodities approximates fair value, because under fair value hedge accounting, the cost basis is adjusted for changes in fair value. For a further discussion of JPMorgan Chase Bank, N.A.'s hedge accounting relationships, see Note 6. To provide consistent fair value disclosure information, all physical commodities inventories have been included in each period presented.

(c) Balances reflect the reduction of securities owned (long positions) by the amount of identical securities sold but not yet purchased (short positions).
(d) As permitted under U.S. GAAP, JPMorgan Chase Bank, N.A. has elected to 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 tables above, JPMorgan Chase Bank, N.A. 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. The level 3 balances would be reduced if netting were applied, including the netting benefit associated with cash collateral. Additionally, includes derivative receivables and payables with affiliates on a net basis. See Note 20 for information regarding our derivative activities with affiliates.
(e) Reflects JPMorgan Chase Bank, N.A.'s adoption of rulebook changes made by two Central counterparty clearinghouses ("CCPs") that require or allow JPMorgan Chase Bank, N.A. to treat certain OTC-cleared derivative transactions as daily settled. For further information, see Note 6.
(f) Certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient are not required to be classified in the fair value hierarchy. At December 31, 2017 and 2016, the fair values of these investments, which include certain hedge funds, private equity funds, real estate and other funds, were $54 million and $50 million, respectively.

Transfers between levels for instruments carried at fair value on a recurring basis

For the years ended December 31, 2017, 2016, and 2015 there were no significant transfers between levels 1 and 2.

During the year ended December 31, 2017, transfers from level 3 to level 2 included the following:

- $1.8 billion of equity derivative receivables and $1.6 billion of equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $1.5 billion of trading loans driven by an increase in observability.

During the year ended December 31, 2017, transfers from level 2 to level 3 included the following:

- $3.4 billion of gross equity derivative receivables and $3.4 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $1.4 billion of long-term debt driven by a decrease in observability.

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

- $1.3 billion of equity derivative receivables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $1.0 billion of long-term debt driven by an increase in observability and a reduction in the significance of unobservable inputs for certain structured notes.

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

- $1.7 billion of gross equity derivative receivables and $1.9 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $1.0 billion of trading loans driven by a decrease in observability.

During the year ended December 31, 2015, transfers from level 3 to level 2 and from level 2 to level 3 included the following:

- $3.5 billion of long-term debt and $1.0 billion of deposits driven by an increase in observability on certain structured notes with embedded interest rate and FX derivatives and a reduction in the significance of unobservable inputs of certain structured notes with embedded equity derivatives.
- $4.4 billion of gross equity derivative receivables and $3.6 billion of equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs, partially offset by transfers into level 3 resulting in net transfers of $2.7 billion and $2.3 billion respectively; $1.5 billion of foreign exchange derivative receivables as a result of an increase in observability of certain valuation input.
- $2.6 billion of trading loans driven by an increase in observability of certain collateralized financing transactions; and $2.3 billion of corporate debt driven by a reduction in the significance of unobservable inputs and an increase in observability for certain structured products.

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

Level 3 valuations

JPMorgan Chase Bank, N.A. has established well-structured processes for determining fair value, including for instruments where fair value is estimated using significant unobservable inputs (level 3). For further information on JPMorgan Chase Bank, N.A.'s valuation process and a detailed discussion of the determination of fair value for individual financial instruments, see pages 20–24 of this Note.

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 JPMorgan Chase Bank, N.A. For instruments valued using internally developed valuation models and other valuation techniques 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 valuation model or other valuation technique to use. Second, due to the lack of observability of significant inputs, management must assess all relevant empirical data in deriving valuation inputs including 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 JPMorgan Chase Bank, N.A.'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, JPMorgan Chase Bank, N.A. 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 JPMorgan Chase Bank, N.A.'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 JPMorgan Chase Bank, N.A.'s estimates and assumptions. Rather, they reflect the characteristics of the various instruments held by JPMorgan Chase Bank, N.A. 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 the characteristics of the instruments held by JPMorgan Chase Bank, N.A. at each balance sheet date.

For JPMorgan Chase Bank, N.A.'s derivatives and structured notes positions classified within level 3 at December 31, 2017, interest rate correlation inputs used in estimating fair value were concentrated towards the upper end of the range; equity correlation, equity-FX and equity-IR correlation inputs were concentrated in the middle of the range; commodity correlation inputs were concentrated in the middle of the range; credit correlation inputs were concentrated towards the lower end of the range; and the interest rate-foreign exchange ("IR-FX") correlation inputs were concentrated towards the lower end of the range. In addition, the interest rate spread volatility inputs used in estimating fair value were distributed across the range; equity volatilities and commodity volatilities were concentrated towards the lower end of the range; and forward commodity prices used in estimating the fair value of commodity derivatives were concentrated towards the lower end of the range. Recovery rate, yield, prepayment speed, conditional default rate, loss severity and price inputs used in estimating the fair value of credit derivatives were distributed across the range; and credit spreads were concentrated towards the lower end of the range.

Level 3 inputs[a]

December 31, 2017

Product/Instrument	Fair value (in millions)	Principal valuation technique	Unobservable inputs[g]	Range of input values	Weighted average
Residential mortgage-backed securities and loans[b]	$ 1,368	Discounted cash flows	Yield	3% 16%	6%
			Prepayment speed	0% - 13%	9%
			Conditional default rate	0% - 5%	1%
			Loss severity	0% - 60%	2%
Commercial mortgage-backed securities and loans[c]	635	Market comparables	Price	$ 0 - $ 100	$ 94
Obligations of U.S. states and municipalities	15	Market comparables	Price	$ 67 - $ 100	$ 90
Corporate debt securities	191	Market comparables	Price	$ 1 - $ 137	$ 83
Loans[d]	921	Market comparables	Price	$ 13 - $ 104	$ 87
Asset-backed securities	276	Discounted cash flows	Credit spread	204bps 205bps	205bps
			Prepayment speed	20%	20%
			Conditional default rate	2%	2%
			Loss severity	30%	30%
	51	Market comparables	Price	$2 - $94	$ 46
Net interest rate derivatives	22	Option pricing	Interest rate spread volatility	27bps - 38bps	
			Interest rate correlation	(50)% - 98%	
			IR-FX correlation	60% - 70%	
	236	Discounted cash flows	Prepayment speed	0% - 30%	
Net credit derivatives	(38)	Discounted cash flows	Credit correlation	40% - 75%	
			Credit spread	6bps - 1,489bps	
			Recovery rate	20% - 70%	
			Yield	1% - 20%	
			Prepayment speed	4% - 21%	
			Conditional default rate	0% - 100%	
			Loss severity	4% - 100%	
	5	Market comparables	Price	$ 10 - $ 98	
Net foreign exchange derivatives	(245)	Option pricing	IR-FX correlation	(50)% - 70%	
	(196)	Discounted cash flows	Prepayment speed	7%	
Net equity derivatives	(1,887)	Option pricing	Equity volatility	20% - 55%	
			Equity correlation	0% - 85%	
			Equity-FX correlation	(50)% - 30%	
			Equity-IR correlation	10% - 40%	
Net commodity derivatives	(648)	Option pricing	Forward commodity price	$54 - $68 per barrel	
			Commodity volatility	5% - 46%	
			Commodity correlation	(40)% - 70%	
MSRs	6,030	Discounted cash flows	Refer to Note 16		
Other assets	350	Discounted cash flows	Credit spread	40bps - 70bps	55bps
Long-term debt, short-term borrowings, and deposits[e]	15,908	Option pricing	Interest rate spread volatility	27bps - 38bps	
			Interest rate correlation	(50)% - 98%	
			IR-FX correlation	(50)% - 70%	
			Equity correlation	0% - 85%	
			Equity-FX correlation	(50)% - 30%	
			Equity-IR correlation	10% - 40%	
Other level 3 assets and liabilities, net[f]	163				

(a) The categories presented in the table have been aggregated based upon the product type, which may differ from their classification on the Consolidated balance sheets. 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) Includes U.S. government agency securities of $289 million, nonagency securities of $25 million and trading loans of $1.1 billion.
(c) Includes nonagency securities of $2 million, trading loans of $357 million and non-trading loans of $276 million.
(d) Includes trading loans of $921 million.
(e) Long-term debt, short-term borrowings and deposits include structured notes issued by JPMorgan Chase Bank, N.A. that are predominantly financial instruments containing embedded derivatives. The estimation of the fair value of structured notes includes the derivative features embedded within the instrument. The significant unobservable inputs are broadly consistent with those presented for derivative receivables.
(f) Includes level 3 assets and liabilities that are insignificant both individually and in aggregate.
(g) Price is a significant unobservable input for certain instruments. When quoted market prices are not readily available, reliance is generally placed on price-based internal valuation techniques. The price input is expressed assuming a par value of $100.

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. Where relationships do 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.

The following discussion also provides a description of attributes of the underlying instruments and external market factors that affect the range of inputs used in the valuation of JPMorgan Chase Bank, N.A.'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 JPMorgan Chase Bank, N.A. 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, obligations of U.S. states and municipalities 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, and 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 has 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 JPMorgan Chase Bank, N.A.'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 concept is 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 factors relating to the underlying mortgages, including the LTV ratio, the nature of the lender's lien on the property and other instrument-specific factors.

Correlation – Correlation is a measure of the relationship between the movements of 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, foreign exchange and commodity) 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, commodity options, and interest rate 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 (e.g., the volatility of a particular equity security may be significantly different from that of a particular commodity index), the tenor of the derivative as well as the strike price of the option.

Changes in level 3 recurring fair value measurements

The following tables include a rollforward of the Consolidated balance sheets amounts (including changes in fair value) for financial instruments classified by JPMorgan Chase Bank, N.A. within level 3 of the fair value hierarchy for the years ended December 31, 2017, 2016 and 2015. When a determination is made to classify a financial instrument within level 3, the determination is based on the significance of the unobservable parameters to the overall fair value measurement. However, level 3 financial instruments typically include, in addition to the unobservable or level 3 components, observable components (that is, components that are actively quoted and can be validated to external sources); accordingly, the gains and losses in the table below include changes in fair value due in part to observable factors that are part of the valuation methodology. Also, JPMorgan Chase Bank, N.A. risk-manages the observable components of level 3 financial instruments using securities and derivative positions that are classified within level 1 or 2 of the fair value hierarchy; as these level 1 and level 2 risk management instruments are not included below, the gains or losses in the following tables do not reflect the effect of JPMorgan Chase Bank, N.A.'s risk management activities related to such level 3 instruments.

Year ended December 31, 2017 (in millions)	Fair value measurements using significant unobservable inputs: Fair value at January 1, 2017	Total realized/ unrealized gains/ (losses)	Purchases[f]	Sales	Settlements[g]	Transfers into level 3[h]	Transfers (out of) level 3[h]	Fair value at Dec. 31, 2017	Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2017
Assets:									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. government agencies	$ 369	$ (11)	$ 155	$ (163)	$ (61)	$ –	$ –	$ 289	$ (17)
Residential – nonagency	11	3	5	–	(4)	18	(9)	24	4
Commercial – nonagency	6	5	1	(5)	(9)	4	–	2	–
Total mortgage-backed securities	386	(3)	161	(168)	(74)	22	(9)	315	(13)
U.S. Treasury and government agencies	–	–	–	–	–	1	–	1	–
Obligations of U.S. states and municipalities	19	1	–	–	(5)	–	–	15	1
Non-U.S. government debt securities	46	–	560	(519)	–	62	(71)	78	–
Corporate debt securities	318	13	514	(472)	(121)	101	(162)	191	5
Loans	4,325	225	2,172	(2,613)	(1,071)	760	(1,466)	2,332	44
Asset-backed securities	70	23	243	(251)	(14)	25	(45)	51	6
Total debt instruments	5,164	259	3,650	(4,023)	(1,285)	971	(1,753)	2,983	43
Equity securities	89	33	51	(44)	(5)	16	(19)	121	23
Other	281	133	151	(51)	(205)	60	(19)	350	110
Total trading assets – debt and equity instruments	5,534	425 (c)	3,852	(4,118)	(1,495)	1,047	(1,791)	3,454	176 (c)
Net derivative receivables:[a]									
Interest rate	1,001	(87)	142	(194)	(494)	41	(151)	258	(688)
Credit	96	(170)	5	(6)	–	81	(39)	(33)	7
Foreign exchange	(1,531)	1	12	(23)	893	(33)	240	(441)	9
Equity	(1,488)	(243)	2,106	(1,162)	(943)	26	(183)	(1,887)	172
Commodity	35	(329)	–	–	(375)	39	(18)	(648)	22
Total net derivative receivables	(1,887)	(828) (c)	2,265	(1,385)	(919)	154	(151)	(2,751)	(478) (c)
Available-for-sale securities:									
Asset-backed securities	663	15	–	(50)	(352)	–	–	276	14
Other	1	–	–	–	–	–	–	1	–
Total available-for-sale securities	664	15 (d)	–	(50)	(352)	–	–	277	14 (d)
Loans	568	34 (c)	1	(26)	(301)	–	–	276	3 (c)
Mortgage servicing rights	6,096	(232) (e)	1,103	(140)	(797)	–	–	6,030	(232) (e)
Other assets	41	9 (c)	–	(13)	(37)	–	–	–	– (c)

Year ended December 31, 2017 (in millions)	Fair value measurements using significant unobservable inputs: Fair value at January 1, 2017	Total realized/ unrealized (gains)/ losses	Purchases	Sales	Issuances	Settlements[g]	Transfers into level 3[h]	Transfers (out of) level 3[h]	Fair value at Dec. 31, 2017	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2017
Liabilities:[b]										
Deposits	$ 2,121	$ 169 (c)(i)	$ –	$ –	$ 2,990	$ (287)	$ 12	$ (855)	$ 4,150	$ 192 (c)(i)
Short-term borrowings	1,019	102 (c)(i)	–	–	3,019	(2,488)	147	(195)	1,604	109 (c)(i)
Trading liabilities – debt and equity instruments	36	(2) (c)	(43)	45	–	1	–	–	37	– (c)
Beneficial interests issued by consolidated VIEs	–	– (c)	–	–	–	–	–	–	–	– (c)
Long-term debt	7,662	1,080 (c)(i)	–	–	7,613	(7,213)	1,398	(386)	10,154	761 (c)(i)

Year ended December 31, 2016 (in millions)	Fair value measurements using significant unobservable inputs								Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2016
	Fair value at January 1, 2016	Total realized/ unrealized gains/ (losses)	Purchases[f]	Sales	Settlements[g]	Transfers into level 3[h]	Transfers (out of) level 3[h]	Fair value at Dec. 31, 2016	
Assets:									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. government agencies	$ 664	$ (20)	$ 78	$ (246)	$ (107)	$ –	$ –	$ 369	$ (36)
Residential – nonagency	19	(4)	6	(6)	(3)	–	(1)	11	(3)
Commercial – nonagency	6	(1)	2	(1)	–	–	–	6	1
Total mortgage-backed securities	689	(25)	86	(253)	(110)	–	(1)	386	(38)
Obligations of U.S. states and municipalities	26	–	–	–	(7)		–	19	–
Non-U.S. government debt securities	74	2	108	(125)	(2)	18	(29)	46	(7)
Corporate debt securities	482	(28)	457	(342)	(177)	128	(202)	318	(21)
Loans	5,364	(351)	2,101	(1,949)	(1,074)	1,010	(776)	4,325	(184)
Asset-backed securities	78	20	297	(262)	(52)	–	(11)	70	7
Total debt instruments	6,713	(382)	3,049	(2,931)	(1,422)	1,156	(1,019)	5,164	(243)
Equity securities	88	–	30	(37)	(2)	10	–	89	(3)
Other	342	212	610	(392)	(413)	24	(102)	281	30
Total trading assets – debt and equity instruments	7,143	(170) [c]	3,689	(3,360)	(1,837)	1,190	(1,121)	5,534	(216) [c]
Net derivative receivables:[a]									
Interest rate	605	771	319	(183)	(722)	(12)	223	1,001	(292)
Credit	535	(737)	5	(4)	231	30	36	96	7
Foreign exchange	(898)	87	64	(124)	(649)	(41)	30	(1,531)	(356)
Equity	(1,223)	(261)	2,720	(2,370)	(12)	(106)	(236)	(1,488)	(114)
Commodity	(1,324)	767	6	–	604	1	(19)	35	464
Total net derivative receivables	(2,305)	627 [c]	3,114	(2,681)	(548)	(128)	34	(1,887)	(291) [c]
Available-for-sale securities:									
Asset-backed securities	779	2	–	–	(118)	–	–	663	2
Other	1	–	–	–	–	–	–	1	–
Total available-for-sale securities	780	2 [d]	–	–	(118)		–	664	2 [d]
Loans	1,408	(48) [c]	259	–	(738)	–	(313)	568	(42) [c]
Mortgage servicing rights	6,608	(163) [e]	679	(109)	(919)	–	–	6,096	(163) [e]
Other assets	5,670	(13) [c]	30	(3,331)	(2,316)	1	–	41	(2) [c]

Year ended December 31, 2016 (in millions)	Fair value measurements using significant unobservable inputs									Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2016
	Fair value at January 1, 2016	Total realized/ unrealized (gains)/ losses	Purchases	Sales	issuances	Settlements[g]	Transfers into level 3[h]	Transfers (out of) level 3[h]	Fair value at Dec. 31, 2016	
Liabilities:[b]										
Deposits	$ 2,970	$ (11) [c]	$ 1	$ –	$ 1,354	$ (1,289)		$ (904)	$ 2,121	$ (178) [c]
Short-term borrowings	636	(232) [c]	–	–	1,712	(1,156)	117	(58)	1,019	(57) [c]
Trading liabilities – debt and equity instruments	48	(22) [c]	(1)	24	–	(10)	1	(4)	36	(1) [c]
Beneficial interests issued by consolidated VIEs	–	(11) [c]	–	–	157	(146)	–	–	–	– [c]
Long-term debt	6,783	81 [c][j]	–	–	5,066 [j]	(3,658)	372	(982)	7,662	304 [c][j]

	Fair value measurements using significant unobservable inputs								
Year ended December 31, 2015 (in millions)	Fair value at January 1, 2015	Total realized/unrealized gains/(losses)	Purchases[f]	Sales	Settlements[g]	Transfers into level 3[h]	Transfers (out of) level 3[h]	Fair value at Dec. 31, 2015	Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2015
Assets:									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. government agencies	$ 904	$ (35)	$ 120	$ (198)	$ (127)	$ –	$ –	$ 664	$ (37)
Residential – nonagency	438	(24)	139	(254)	(6)	–	(274)	19	(4)
Commercial – nonagency	217	(7)	43	(91)	(16)	–	(140)	6	1
Total mortgage-backed securities	1,559	(66)	302	(543)	(149)	–	(414)	689	(40)
Obligations of U.S. states and municipalities	59	–	–	–	(5)	5	(33)	26	–
Non-U.S. government debt securities	302	9	205	(123)	(64)	16	(271)	74	(15)
Corporate debt securities	2,756	(63)	1,103	(1,064)	(89)	165	(2,326)	482	(3)
Loans	9,830	(254)	2,995	(4,149)	(1,189)	465	(2,334)	5,364	(128)
Asset-backed securities	374	(29)	121	(294)	(14)	–	(80)	78	(12)
Total debt instruments	14,880	(403)	4,726	(6,173)	(1,510)	651	(5,458)	6,713	(198)
Equity securities	73	22	52	(35)	(28)	13	(9)	88	33
Other	1,184	110	1,642	(1,476)	(234)	28	(912)	342	99
Total trading assets – debt and equity instruments	16,137	(271) (c)	6,420	(7,684)	(1,772)	692	(6,379)	7,143	(66) (c)
Net derivative receivables:[a]									
Interest rate	335	1,146	545	(245)	(709)	12	(479)	605	218
Credit	185	110	145	(133)	129	28	71	535	256
Foreign exchange	(761)	627	40	(137)	(277)	52	(442)	(898)	151
Equity	(560)	649	3,021	(3,889)	(28)	342	(758)	(1,223)	74
Commodity	(805)	(893)	(245)	(12)	657	(13)	(13)	(1,324)	(780)
Total net derivative receivables	(1,606)	1,639 (c)	3,506	(4,416)	(228)	421	(1,621)	(2,305)	(81) (c)
Available-for-sale securities:									
Asset-backed securities	833	(22)	48	(20)	(60)	–	–	779	(28)
Other	129	–	–	–	(29)	–	(99)	1	–
Total available-for-sale securities	962	(22) (d)	48	(20)	(89)	–	(99)	780	(28) (d)
Loans	2,213	(143) (c)	1,170	–	(985)	–	(847)	1,408	(40) (c)
Mortgage servicing rights	7,436	(405) (e)	985	(486)	(922)	–	–	6,608	(405) (e)
Other assets	4,593	(2) (c)	19	(3,334)	4,394	–	–	5,670	(4) (c)

	Fair value measurements using significant unobservable inputs									
Year ended December 31, 2015 (in millions)	Fair value at January 1, 2015	Total realized/unrealized (gains)/losses	Purchases	Sales	Issuances	Settlements[g]	Transfers into level 3[h]	Transfers (out of) level 3[h]	Fair value at Dec. 31, 2015	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2015
Liabilities:[b]										
Deposits	$ 2,883	$ (16) (c)	$ 1	$ –	$ 1,945	$ (830)	$ –	$ (1,013)	$ 2,970	$ (14) (c)
Short-term borrowings	1,426	(682) (c)	–	–	3,078	(2,753)	131	(564)	636	(48) (c)
Trading liabilities – debt and equity instruments	51	15 (c)	(141)	134	–	(15)	7	(3)	48	(5) (c)
Beneficial interests issued by consolidated VIEs	18	(17) (c)	–	–	208	(209)		–	–	– (c)
Long-term debt	6,970	(414) (c)	(58)	–	6,373	(5,082)	183	(1,189)	6,783	319 (c)

(a) All level 3 derivatives are presented on a net basis, irrespective of underlying counterparty.
(b) Level 3 liabilities as a percentage of total JPMorgan Chase Bank, N.A. liabilities accounted for at fair value (including liabilities measured at fair value on a nonrecurring basis) were 19%, 14% and 15% at December 31, 2017, 2016 and 2015, respectively.

(c) Predominantly reported in principal transactions revenue, except for changes in fair value for consumer & community banking business mortgage loans and lending-related commitments originated with the intent to sell, and mortgage loan purchase commitments, which are reported in mortgage fees and related income.
(d) Realized gains/(losses) on AFS securities, as well as other-than-temporary impairment ("OTTI") losses that are recorded in earnings, are reported in securities gains. Unrealized gains/(losses) are reported in OCI. There were no realized gains/(losses) and foreign exchange hedge accounting adjustments recorded in income on AFS securities for the years ended December 31, 2017, 2016 and 2015. Unrealized gains/(losses) recorded on AFS securities in OCI were $15 million, $2 million and $(25) million for the years ended December 31, 2017, 2016 and 2015, respectively.
(e) Changes in fair value for the consumer & community banking business's MSRs are reported in mortgage fees and related income.
(f) Loan originations are included in purchases.
(g) Includes financial assets and liabilities that have matured, been partially or fully repaid, impacts of modifications, and deconsolidation associated with beneficial interests in VIEs and other items.
(h) All transfers into and/or out of level 3 are based on changes in the observability of the valuation inputs and are assumed to occur at the beginning of the interim reporting period in which they occur.
(i) Realized (gains)/losses due to DVA for fair value option elected liabilities are reported in principal transactions revenue. Unrealized (gains)/losses are reported in OCI. Unrealized loss were $6 million for the year ended December 31, 2017. There were no realized gains for the year ended December 31, 2017.
(j) The prior period amounts have been revised to conform with the current period presentation.

Level 3 analysis

Consolidated balance sheets changes

Level 3 assets (including assets measured at fair value on a nonrecurring basis) were 1.0% of total JPMorgan Chase Bank, N.A. assets and 4.5% of total assets measured at fair value at December 31, 2017, compared with 1.1% and 4.5%, respectively, at December 31, 2016. The following describes significant changes to level 3 assets since December 31, 2016, for those items measured at fair value on a recurring basis. For further information on changes impacting items measured at fair value on a nonrecurring basis, see Assets and liabilities measured at fair value on a nonrecurring basis on page 36.

For the year ended December 31, 2017

Level 3 assets were $20.4 billion at December 31, 2017, reflecting a decrease of $886 million from December 31, 2016, largely due to the following:

- $1.1 billion increase in principal transactions on derivative receivables
- $2.1 billion decrease in trading assets – debt and equity instruments was driven by a decrease of $2.0 billion in trading loans due to settlements and transfers

Gains and losses

The following describes significant components of total realized/unrealized gains/(losses) for instruments measured at fair value on a recurring basis for the years ended December 31, 2017, 2016 and 2015. For further information on these instruments, see Changes in level 3 recurring fair value measurements rollforward tables on pages 31–35.

2017

- 1.3 billion of net losses on liabilities largely driven by market movements in long-term debt

2016

- There were no individually significant movements for the year ended December 31, 2016

2015

- $2.4 billion of net gains in interest rate, foreign exchange and equity derivative receivables largely due to market movements; partially offset by losses on commodity derivatives due to market movements
- $1.1 billion of net gains in liabilities due to market movements

Assets and liabilities measured at fair value on a nonrecurring basis

The following tables present the assets reported on a nonrecurring basis at fair value as of December 31, 2017 and 2016, by major product category and fair value hierarchy.

	Fair value hierarchy			
December 31, 2017 (in millions)	Level 1	Level 2	Level 3	Total fair value
Loans	**$ –**	**$ 25**	**$ 596** (a)	**$ 621**
Other assets	**–**	**228**	**181**	**409**
Total assets measured at fair value on a nonrecurring basis	**–**	**253**	**777** (a)	**1,030**

	Fair value hierarchy			
December 31, 2016 (in millions)	Level 1	Level 2	Level 3	Total fair value
Loans	$ –	$ 730	$ 590	$ 1,320
Other assets	–	3	228	231
Total assets measured at fair value on a nonrecurring basis	–	733	818	1,551

(a) Of the $777 million in level 3 assets measured at fair value on a nonrecurring basis as of December 31, 2017, $442 million related to residential real estate loans carried at the net realizable value of the underlying collateral (e.g., collateral-dependent loans and other loans charged off in accordance with regulatory guidance). These amounts are classified as level 3 as they are valued using a broker's price opinion and discounted based upon JPMorgan Chase Bank, N.A.'s experience with actual liquidation values. These discounts to the broker price opinions ranged from 13% to 48% with a weighted average of 27%.

There were no material liabilities measured at fair value on a nonrecurring basis at December 31, 2017 and 2016.

Nonrecurring fair value changes

The following table presents the total change in value of assets and liabilities for which a fair value adjustment has been recognized for the years ended December 31, 2017, 2016 and 2015, related to financial instruments held at those dates.

December 31, (in millions)	2017	2016	2015
Loans	**$ (159)**	$ (209)	$ (225)
Other Assets	**(141)**	35	(61)
Accounts payable and other liabilities	**(1)**	–	(8)
Total nonrecurring fair value gains/(losses)	**$ (301)**	$ (174)	$ (294)

For further information about the measurement of impaired collateral-dependent loans, and other loans where the carrying value is based on the fair value of the underlying collateral (e.g., residential mortgage loans charged off in accordance with regulatory guidance), see Note 13.

Additional disclosures about the fair value of financial instruments that are not carried on the Consolidated balance sheets at fair value

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 value. Financial instruments within the scope of these disclosure requirements are included in the following table. However, certain financial instruments and all nonfinancial instruments are excluded from the scope of these disclosure requirements. Accordingly, the fair value disclosures provided in the following table include only a partial estimate of the fair value of JPMorgan Chase Bank, N.A.'s assets and liabilities. For example, JPMorgan Chase Bank, N.A. has developed long-term relationships with its customers through its deposit base and credit card accounts, commonly referred to as core deposit intangibles and credit card relationships. In the opinion of management, these items, in the aggregate, add significant value to JPMorgan Chase Bank, N.A., but their fair value is not disclosed in this Note.

Financial instruments for which carrying value approximates fair value

Certain financial instruments that are not carried at fair value on the Consolidated balance sheets are carried at amounts that approximate fair value, due to their short-term nature and generally negligible credit risk. These instruments include cash and due from banks, deposits with banks, federal funds sold, securities purchased under resale agreements and securities borrowed, short-term receivables and accrued interest receivable, short-term borrowings, federal funds purchased, securities loaned and sold under repurchase agreements, accounts payable, and accrued liabilities. In addition, U.S. GAAP requires that the fair value of deposit liabilities with no stated maturity (i.e., demand, savings and certain money market deposits) be equal to their carrying value; recognition of the inherent funding value of these instruments is not permitted.

The following table presents by fair value hierarchy classification the carrying values and estimated fair values at December 31, 2017 and 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. For additional information regarding the financial instruments within the scope of this disclosure, and the methods and significant assumptions used to estimate their fair value, see pages 21–24 of this Note.

	December 31, 2017					December 31, 2016				
		Estimated fair value hierarchy					Estimated fair value hierarchy			
(in billions)	Carrying value	Level 1	Level 2	Level 3	Total estimated fair value	Carrying value	Level 1	Level 2	Level 3	Total estimated fair value
Financial assets										
Cash and due from banks	**$ 21.9**	**$ 21.9**	**$ –**	**$ –**	**$ 21.9**	$ 21.2	$ 21.2	$ –	$ –	$ 21.2
Deposits with banks	**440.0**	**386.5**	**53.5**	**–**	**440.0**	388.7	352.4	36.3	–	388.7
Accrued interest and accounts receivable	**47.3**	**–**	**47.3**	**–**	**47.3**	40.8	–	40.7	–	40.7
Federal funds sold and securities purchased under resale agreements	**152.3**	**–**	**152.3**	**–**	**152.3**	167.3	–	167.1	0.2	167.3
Securities borrowed	**36.0**	**–**	**36.0**	**–**	**36.0**	32.5	–	32.5	–	32.5
Securities, held-to-maturity	**47.7**	**–**	**48.7**	**–**	**48.7**	50.1	–	50.9	–	50.9
Loans, net of allowance for loan losses(a)(b)	**813.6**	**–**	**219.3**	**597.5**	**816.8**	779.2	–	29.3	744.9	774.2
Other	**48.0**	**–**	**39.3**	**9.2**	**48.5**	48.4	–	39.2	9.0	48.2
Financial liabilities										
Deposits	**$ 1,513.5**	**$ –**	**$ 1,513.6**	**$ –**	**$ 1,513.6**	$ 1,466.2	$ –	$ 1,466.4	$ –	$ 1,466.4
Federal funds purchased and securities loaned or sold under repurchase agreements	**91.3**	**–**	**91.3**	**–**	**91.3**	74.4	–	74.4	–	74.4
Short-term borrowings	**3.4**	**–**	**3.2**	**0.2**	**3.4**	6.6	–	6.6	–	6.6
Accounts payable and other liabilities	**61.8**	**–**	**58.9**	**2.7**	**61.6**	52.7	–	49.7	3.0	52.7
Beneficial interests issued by consolidated VIEs	**4.9**	**–**	**4.9**	**–**	**4.9**	7.5	–	7.4	–	7.4
Long-term debt and junior subordinated deferrable interest debentures	**76.3**	**–**	**72.8**	**2.7**	**75.5**	92.2	–	90.1	2.0	92.1

(a) Fair value is typically estimated using a discounted cash flow model that incorporates the characteristics of the underlying loans (including principal, contractual interest rate and contractual fees) and other key inputs, including expected lifetime credit losses, interest rates, prepayment rates, and primary origination or secondary market spreads. For certain loans, the fair value is measured based on the value of the underlying collateral. The difference between the estimated fair value and carrying value of a financial asset or liability is the result of the different methodologies used to determine fair value as compared with carrying value. For example, credit losses are estimated for a financial asset's remaining life in a fair value calculation but are estimated for a loss emergence period in the allowance for loan loss calculation; future loan income (interest and fees) is incorporated in a fair value calculation but is generally not considered in the allowance for loan losses. For a further discussion of JPMorgan Chase Bank, N.A.'s methodologies for estimating the fair value of loans and lending-related commitments, see Valuation hierarchy on pages 21–24.

(b) For the year ended December 31, 2017, JPMorgan Chase Bank, N.A. transferred certain residential mortgage loans from Level 3 to Level 2 as a result of an increase in observability.

The majority of JPMorgan Chase Bank, N.A.'s lending-related commitments are not carried at fair value on a recurring basis on the Consolidated balance sheets. The carrying value of the wholesale allowance for lending-related commitments and the estimated fair value of these wholesale lending-related commitments were as follows for the periods indicated.

	December 31, 2017					December 31, 2016				
		Estimated fair value hierarchy					Estimated fair value hierarchy			
(in billions)	**Carrying value[(a)]**	**Level 1**	**Level 2**	**Level 3**	**Total estimated fair value**	Carrying value[(a)]	Level 1	Level 2	Level 3	Total estimated fair value
Wholesale lending-related commitments	**$ 1.1**	**$ –**	**$ –**	**$ 1.6**	**$ 1.6**	$ 1.1	$ –	$ –	$ 2.1	$ 2.1

(a) Excludes the current carrying values of the guarantee liability and the offsetting asset, each of which is recognized at fair value at the inception of the guarantees.

JPMorgan Chase Bank, N.A. does not estimate the fair value of consumer lending-related commitments. In many cases, JPMorgan Chase Bank, N.A. can reduce or cancel these commitments by providing the borrower notice or, in some cases as permitted by law, without notice. For a further discussion of the valuation of lending-related commitments, see page 22 of this Note.

Note 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, unrecognized firm commitments, and written loan commitments.

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

JPMorgan Chase Bank, N.A.'s election of fair value includes the following instruments:

- Loans purchased or originated as part of securitization warehousing activity, subject to bifurcation accounting, or managed on a fair value basis, including lending-related commitments
- Certain securities financing arrangements with an embedded derivative and/or a maturity of greater than one year
- Owned beneficial interests in securitized financial assets that contain embedded credit derivatives, which would otherwise be required to be separately accounted for as a derivative instrument
- Structured notes, which are predominantly financial instruments that contain embedded derivatives, that are issued as part of the corporate & investment banking business's client-driven activities
- Certain long-term beneficial interests issued by the corporate & investment banking business's consolidated securitization trusts where the underlying assets are carried at fair value

Changes in fair value under the fair value option election

The following table presents the changes in fair value included in the Consolidated statements of income for the years ended December 31, 2017, 2016 and 2015, for items for which the fair value option was elected. The profit and loss information presented below only includes the financial instruments that were elected to be measured at fair value; related risk management instruments, which are required to be measured at fair value, are not included in the table.

	2017			2016			2015		
December 31, (in millions)	Principal transactions	All other income	Total changes in fair value recorded	Principal transactions	All other income	Total changes in fair value recorded	Principal transactions	All other income	Total changes in fair value recorded
Federal funds sold and securities purchased under resale agreements	**$ 22**	**$ –**	**$ 22**	$ (56)	$ –	$ (56)	$ (32)	$ –	$ (32)
Securities borrowed	**50**	**–**	**50**	1	–	1	(6)	–	(6)
Trading assets:									
Debt and equity instruments, excluding loans	**1,851**	**2** (c)	**1,853**	144	–	144	603	–	603
Loans reported as trading assets:									
Changes in instrument-specific credit risk	**298**	**14** (c)	**312**	423	43 (c)	466	101	41 (c)	142
Other changes in fair value	**216**	**747** (c)	**963**	68	684 (c)	752	200	818 (c)	1,018
Loans:									
Changes in instrument-specific credit risk	**(1)**	**–**	**(1)**	13	–	13	37	–	37
Other changes in fair value	**(12)**	**3** (c)	**(9)**	(7)	–	(7)	4	–	4
Other assets	**–**	**3** (d)	**3**	(6)	– (d)	(6)	(2)	5 (d)	3
Deposits[(a)]	**(546)**	**–**	**(546)**	(165)	–	(165)	94	–	94
Federal funds purchased and securities loaned or sold under repurchase agreements	**(38)**	**–**	**(38)**	12	–	12	6	–	6
Short-term borrowings[(a)]	**(1,186)**	**–**	**(1,186)**	21	–	21	194	–	194
Trading liabilities	**(1)**	**–**	**(1)**	6	–	6	(20)	–	(20)
Beneficial interests issued by consolidated VIEs	**–**	**–**	**–**	–	–	–	14	–	14
Long-term debt[(a)(b)]	**(969)**	**–**	**(969)**	(632)	–	(632)	1,052	–	1,052

(a) Unrealized gains/(losses) due to instrument-specific credit risk (DVA) for liabilities for which the fair value option has been elected is recorded in OCI, while realized gains/(losses) are recorded in principal transactions revenue. DVA for 2015 was included in principal transactions revenue, and includes the impact of JPMorgan Chase Bank, N.A.'s own credit quality on the inception value of liabilities as well as the impact of changes in JPMorgan Chase Bank, N.A.'s own credit quality subsequent to issuance. See Notes 3 and 21 for further information. Realized gains/(losses) due to instrument-specific credit risk recorded in principal transaction revenue were not material for the years ended December 31, 2017 and 2016.
(b) Long-term debt measured at fair value predominantly relates to structured notes. Although the risk associated with the structured notes is actively managed, the gains/(losses) reported in this table do not include the income statement impact of the risk management instruments used to manage such risk.
(c) Reported in mortgage fees and related income.
(d) Reported in other income.

Determination of instrument-specific credit risk for items for which a fair value election was made

The following describes how the gains and losses that are attributable to changes in instrument-specific credit risk, were determined.

- Loans and lending-related commitments: For floating-rate instruments, all changes in value are attributed to instrument-specific credit risk. For fixed-rate instruments, an allocation of the changes in value for the period is made between those changes in value that are interest rate-related and changes in value that are credit-related. Allocations are generally based on an analysis of borrower-specific credit spread and recovery information, where available, or benchmarking to similar entities or industries.
- Long-term debt: Changes in value attributable to instrument-specific credit risk were derived principally from observable changes in JPMorgan Chase Bank, N.A.'s credit spread.
- Resale and repurchase agreements, securities borrowed agreements and securities lending agreements: Generally, for these types of agreements, there is a requirement that collateral be maintained with a market value equal to or in excess of the principal amount loaned; as a result, there would be no adjustment or an immaterial adjustment for instrument-specific credit risk related to these agreements.

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, 2017 and 2016, for loans, long-term debt and long-term beneficial interests for which the fair value option has been elected.

	2017			2016		
December 31, (in millions)	Contractual principal outstanding	Fair value	Fair value over/ (under) contractual principal outstanding	Contractual principal outstanding	Fair value	Fair value over/ (under) contractual principal outstanding
Loans[(a)]						
Nonaccrual loans						
Loans reported as trading assets	**$ 2,703**	**$ 1,073**	**$ (1,630)**	$ 1,986	$ 477	$ (1,509)
Loans	**39**	**—**	**(39)**	—	—	—
Subtotal	**2,742**	**1,073**	**(1,669)**	1,986	477	(1,509)
All other performing loans						
Loans reported as trading assets	**36,637**	**36,338**	**(299)**	33,736	32,606	(1,130)
Loans	**2,539**	**2,508**	**(31)**	2,259	2,228	(31)
Total loans	**$ 41,918**	**$ 39,919**	**$ (1,999)**	$ 37,981	$ 35,311	$ (2,670)
Long-term debt						
Principal-protected debt	**$ 6,253** (c)	**$ 6,024**	**$ (229)**	$ 3,577 (c)	$ 3,280	$ (297)
Nonprincipal-protected debt[(b)]	**—**	**15,377**	**NA**	NA	11,656	NA
Total long-term debt	**NA**	**$ 21,401**	**NA**	NA	$ 14,936	NA

(a) There were no performing loans that were ninety days or more past due as of December 31, 2017 and 2016.
(b) Remaining contractual principal is not applicable to nonprincipal-protected notes. Unlike principal-protected structured notes, for which JPMorgan Chase Bank, N.A. is obligated to return a stated amount of principal at the maturity of the note, nonprincipal-protected structured notes do not obligate JPMorgan Chase Bank, N.A. 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 JPMorgan Chase Bank, N.A. as issuer for both nonprincipal-protected and principal protected notes.
(c) Where JPMorgan Chase Bank, N.A. 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 JPMorgan Chase Bank, N.A.'s next call date.

At December 31, 2017 and 2016, the contractual amount of lending-related commitments for which the fair value option was elected was $7.4 billion and $4.6 billion, respectively, with a corresponding fair value of $(82) million and $(131) million, respectively. For further information regarding off-balance sheet lending-related financial instruments, see Note 25.

Note 5 – Credit risk concentrations

Concentrations of credit risk arise when a number of clients, counterparties or customers are engaged in similar business activities or activities in the same geographic region, or when they have similar economic features that would cause their ability to meet contractual obligations to be similarly affected by changes in economic conditions.

JPMorgan Chase Bank, N.A. regularly monitors various segments of its credit portfolios to assess potential credit risk concentrations and to obtain additional collateral when deemed necessary and permitted under JPMorgan Chase Bank, N.A.'s agreements. Senior management is significantly involved in the credit approval and review process, and risk levels are adjusted as needed to reflect JPMorgan Chase Bank, N.A.'s risk appetite.

In JPMorgan Chase Bank, N.A.'s consumer portfolio, concentrations are evaluated primarily by product and by U.S. geographic region, with a key focus on trends and concentrations at the portfolio level, where potential credit risk concentrations can be remedied through changes in underwriting policies and portfolio guidelines. In the wholesale portfolio, credit risk concentrations are evaluated primarily by industry and monitored regularly on both an aggregate portfolio level and on an individual client or counterparty basis. JPMorgan Chase Bank, N.A.'s wholesale exposure is managed through loan syndications and participations, loan sales, securitizations, credit derivatives, master netting agreements, collateral and other risk-reduction techniques. For additional information on loans, see Note 13.

JPMorgan Chase Bank, N.A. does not believe that its exposure to any particular loan product (e.g., option adjustable rate mortgages ("ARMs")), or industry segment (e.g., real estate), or its exposure to residential real estate loans with high LTV ratios, results in a significant concentration of credit risk.

Terms of loan products and collateral coverage are included in JPMorgan Chase Bank, N.A.'s assessment when extending credit and establishing its allowance for loan losses.

The table below presents both on–balance sheet and off–balance sheet consumer and wholesale-related credit exposure by JPMorgan Chase Bank, N.A.'s three credit portfolio segments as of December 31, 2017 and 2016.

In 2017 JPMorgan Chase Bank, N.A. revised its methodology for the assignment of industry classifications, to better monitor and manage concentrations. This largely resulted in the re-assignment of holding companies from Other to the industry of risk category based on the primary business activity of the holding company's underlying entities. In the tables and industry discussions below, the prior period amounts have been revised to conform with the current period presentation.

	2017				2016				
		On-balance sheet				On-balance sheet			
December 31, (in millions)	Credit exposure[f]	Loans	Derivatives	Off-balance sheet[g]	Credit exposure	Loans	Derivatives	Off-balance sheet[g]	
Total consumer, excluding credit card	**$ 421,198**	**$ 372,645**	**$ –**	**$ 48,553**	$ 418,059	$ 364,598	$ –	$ 53,461	[h]
Total credit card	**53,162**	**41,035**	**–**	**12,127**	47,076	35,878	–	11,198	
Total consumer	**474,360**	**413,680**	**–**	**60,680**	465,135	400,476	–	64,659	[h]
Wholesale-related[a]									
Real Estate	**139,403**	**113,642**	**153**	**25,608**	134,179	105,796	204	28,179	
Consumer & Retail	**87,651**	**31,016**	**1,114**	**55,521**	84,609	29,801	1,082	53,726	
Technology, Media & Telecommunications	**59,246**	**13,663**	**2,265**	**43,318**	63,296	14,061	1,292	47,943	
Healthcare	**55,341**	**15,698**	**2,110**	**37,533**	48,829	14,906	2,303	31,620	
Industrials	**55,262**	**18,154**	**1,160**	**35,948**	55,726	17,288	1,658	36,780	
Banks & Finance Cos	**54,021**	**30,880**	**6,784**	**16,357**	54,808	27,714	13,657	13,437	
Oil & Gas	**41,023**	**12,493**	**1,561**	**26,969**	40,243	13,147	1,860	25,236	
Asset Managers	**31,801**	**11,326**	**7,707**	**12,768**	31,671	10,093	10,646	10,932	
Utilities	**28,859**	**6,083**	**1,806**	**20,970**	29,536	7,061	969	21,506	
State & Municipal Govt[b]	**27,828**	**11,407**	**2,810**	**13,611**	27,387	11,518	2,118	13,751	
Central Govt	**19,129**	**3,375**	**13,884**	**1,870**	20,346	3,964	14,173	2,209	
Chemicals & Plastics	**15,934**	**5,654**	**197**	**10,083**	15,043	5,292	271	9,480	
Transportation	**15,776**	**6,714**	**975**	**8,087**	19,006	8,971	751	9,284	
Automotive	**14,820**	**4,903**	**342**	**9,575**	16,736	4,964	1,196	10,576	
Metals & Mining	**14,160**	**4,728**	**691**	**8,741**	13,402	4,349	436	8,617	
Insurance	**14,087**	**1,411**	**2,802**	**9,874**	13,505	1,119	3,377	9,009	
Securities Firms	**4,366**	**1,679**	**1,680**	**1,007**	4,055	1,300	1,913	842	
Financial Markets Infrastructure	**4,073**	**351**	**2,536**	**1,186**	4,878	347	2,461	2,070	
All other[c]	**148,030**	**113,749**	**4,048**	**30,233**	137,756	105,441	3,551	28,764	
Subtotal	**830,810**	**406,926**	**54,625**	**369,259**	815,011	387,132	63,918	363,961	
Loans held-for-sale and loans at fair value	**5,607**	**5,607**	**–**	**–**	4,511	4,511	–	–	
Receivables from customers and other[d]	**1,635**	**–**	**–**	**–**	1,197	–	–	–	
Total wholesale-related	**838,052**	**412,533**	**54,625**	**369,259**	820,719	391,643	63,918	363,961	
Total exposure[e][f]	**$1,312,412**	**$ 826,213**	**$ 54,625**	**$ 429,939**	$1,285,854	$ 792,119	$ 63,918	$ 428,620	[h]

(a) The industry rankings presented in the table as of December 31, 2016, are based on the industry rankings of the corresponding exposures at December 31, 2017, not actual rankings of such exposures at December 31, 2016.
(b) In addition to the credit risk exposure to states and municipal governments (both U.S. and non-U.S.) at December 31, 2017 and 2016, noted above, JPMorgan Chase Bank, N.A. held: $4.3 billion and $3.9 billion, respectively, of trading securities; $30.2 billion and $28.9 billion, respectively, of AFS securities; and 14.4 billion and $14.5 billion, respectively, of HTM securities, issued by U.S. state and municipal governments. For further information, see Note 3 and Note 11.
(c) All other includes: individuals; SPEs; and private education and civic organizations. For more information on exposures to SPEs, see Note 15.
(d) Receivables from customers primarily represent held-for-investment margin loans to brokerage customers (prime services, the asset & wealth management business and the consumer & community banking business) that are collateralized through assets maintained in the clients' brokerage accounts, as such no allowance is held against these receivables. These receivables are reported within accrued interest and accounts receivable on JPMorgan Chase Bank, N.A.'s Consolidated balance sheets.
(e) Excludes cash placed with banks of $401.8 billion and $367.9 billion, at December 31, 2017 and 2016, respectively, which is predominantly placed with various central banks, primarily Federal Reserve Banks.
(f) Credit exposure is net of risk participations and excludes the benefit of credit derivatives used in credit portfolio management activities held against derivative receivables or loans and liquid securities and other cash collateral held against derivative receivables.
(g) Represents lending-related financial instruments.
(h) The prior period amounts have been revised to conform with the current period presentation.

Note 6 – 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. JPMorgan Chase Bank, N.A. makes markets in derivatives for clients and also uses derivatives to hedge or manage its own risk exposures. Predominantly all of JPMorgan Chase Bank, N.A.'s derivatives are entered into for market-making or risk management purposes.

Market-making derivatives

The majority of JPMorgan Chase Bank, N.A.'s derivatives are entered into for market-making purposes. Clients use derivatives to mitigate or modify interest rate, credit, foreign exchange, equity and commodity risks. JPMorgan Chase Bank, N.A. actively manages the risks from its exposure to these derivatives by entering into other derivative transactions or by purchasing or selling other financial instruments that partially or fully offset the exposure from client derivatives.

Risk management derivatives

JPMorgan Chase Bank, N.A. manages certain market and credit risk exposures using derivative instruments, including derivatives in hedge accounting relationships and other derivatives that are used to manage risks associated with specified assets and liabilities.

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. Similarly, interest income and expense increases or decreases as a result of variable-rate assets and liabilities resetting to current market rates, and as a result of the repayment and subsequent origination or issuance of fixed-rate assets and liabilities at current market rates. Gains or losses on the derivative instruments that are related to such assets and liabilities are expected to substantially offset this variability in earnings. JPMorgan Chase Bank, N.A. 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 and forecasted transactions, as well as JPMorgan Chase Bank, N.A.'s net investments in certain non-U.S. subsidiaries or branches whose functional currencies are not the U.S. dollar. As a result of fluctuations in foreign currencies, the U.S. dollar–equivalent values of the foreign currency–denominated assets and liabilities or the forecasted revenues or expenses increase or decrease. Gains or losses on the derivative instruments related to these foreign currency–denominated assets or liabilities, or forecasted transactions, are expected to substantially offset this variability.

Commodities contracts are used to manage the price risk of certain commodities inventories. Gains or losses on these derivative instruments are expected to substantially offset the depreciation or appreciation of the related inventory.

Credit derivatives are used to manage the counterparty credit risk associated with loans and lending-related commitments. 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 CDS. For a further discussion of credit derivatives, see the discussion in the Credit derivatives section on pages 53–56 of this Note.

For more information about risk management derivatives, see the risk management derivatives gains and losses table on page 53 of this Note, and the hedge accounting gains and losses tables on pages 51–53 of this Note.

Derivative counterparties and settlement types

JPMorgan Chase Bank, N.A. enters into OTC derivatives with third parties and JPMorgan Chase affiliates, which are negotiated and settled bilaterally with the derivative counterparty. JPMorgan Chase Bank, N.A. 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 CCPs. ETD contracts are generally standardized contracts traded on an exchange and cleared by the CCP, which is JPMorgan Chase Bank, N.A.'s 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

JPMorgan Chase Bank, N.A. provides clearing services for clients in which JPMorgan Chase Bank, N.A. acts as a clearing member at certain derivative exchanges and clearing houses. JPMorgan Chase Bank, N.A. does not reflect the clients' derivative contracts in its Consolidated Financial Statements. For further information on JPMorgan Chase Bank, N.A.'s clearing services, see Note 25.

Accounting for derivatives

All free-standing derivatives that JPMorgan Chase Bank, N.A. executes for its own account are required to be recorded on the Consolidated balance sheets at fair value.

As permitted under U.S. GAAP JPMorgan Chase Bank, N.A. nets derivative assets and liabilities, and the related cash collateral receivables and payables, when a legally enforceable master netting agreement exists between JPMorgan Chase Bank, N.A. and the derivative counterparty. For further discussion of the offsetting of assets and liabilities, see Note 1. 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 tabular disclosures on pages 47–53 of this Note provide additional information on the amount of, and reporting for, derivative assets, liabilities, gains and losses. For further discussion of derivatives embedded in structured notes, see Notes 3 and 4.

Derivatives designated as hedges
JPMorgan Chase Bank, N.A. applies hedge accounting to certain derivatives executed for risk management purposes – generally interest rate, foreign exchange and commodity derivatives. However, JPMorgan Chase Bank, N.A. does not seek to apply hedge accounting to all of the derivatives involved in its risk management activities. For example, JPMorgan Chase Bank, N.A. does not apply hedge accounting to purchased CDS used to manage the credit risk of loans and lending-related commitments, because of the difficulties in qualifying such contracts as hedges. For the same reason, JPMorgan Chase Bank, N.A. does not apply hedge accounting to certain interest rate and foreign exchange derivatives used for risk management purposes.

To qualify for hedge accounting, a derivative must be highly effective at reducing the risk associated with the exposure being hedged. In addition, for a derivative to be designated as a hedge, the risk management objective and strategy must be documented. Hedge documentation must identify the derivative hedging instrument, the asset or liability or forecasted transaction and type of risk to be hedged, and how the effectiveness of the derivative is assessed prospectively and retrospectively. To assess effectiveness, JPMorgan Chase Bank, N.A. uses statistical methods such as regression analysis, as well as nonstatistical methods including dollar-value comparisons of the change in the fair value of the derivative to the change in the fair value or cash flows of the hedged item. The extent to which a derivative has been, and is expected to continue to be, effective at offsetting changes in the fair value or cash flows of the hedged item must be assessed and documented at least quarterly. Any hedge ineffectiveness (i.e., the amount by which the gain or loss on the designated derivative instrument does not exactly offset the change in the hedged item attributable to the hedged risk) must be reported in current-period earnings. If it is determined that a derivative is not highly effective at hedging the designated exposure, hedge accounting is discontinued.

There are three types of hedge accounting designations: fair value hedges, cash flow hedges and net investment hedges. JPMorgan Chase Bank, N.A. uses fair value hedges primarily to hedge fixed-rate long-term debt, AFS securities and certain commodities inventories. For qualifying fair value hedges, the changes in the fair value of the derivative, and in the value of the hedged item for the risk being hedged, are recognized in earnings. If the hedge relationship is terminated, then the adjustment to the hedged item continues to be reported as part of the basis of the hedged item, and for benchmark interest rate hedges, is amortized to earnings as a yield adjustment. Derivative amounts affecting earnings are recognized consistent with the classification of the hedged item – primarily net interest income and principal transactions revenue.

JPMorgan Chase Bank, N.A. uses cash flow hedges primarily to hedge the exposure to variability in forecasted cash flows from floating-rate assets and liabilities and foreign currency–denominated revenue and expense. For qualifying cash flow hedges, the effective portion of the change in the fair value of the derivative is recorded in OCI and recognized in the Consolidated statements of income when the hedged cash flows affect earnings. Derivative amounts affecting earnings are recognized consistent with the classification of the hedged item – primarily interest income, interest expense, noninterest revenue and compensation expense. The ineffective portions of cash flow hedges are immediately recognized in earnings. If the hedge relationship is terminated, then the value of the derivative recorded in accumulated other comprehensive income/(loss) (“AOCI”) is recognized in earnings when the cash flows that were hedged affect earnings. For hedge relationships that are discontinued because a forecasted transaction is not expected to occur according to the original hedge forecast, any related derivative values recorded in AOCI are immediately recognized in earnings.

JPMorgan Chase Bank, N.A. uses net investment hedges to protect the value of JPMorgan Chase Bank, N.A.’s net investments in certain non-U.S. subsidiaries or branches whose functional currencies are not the U.S. dollar. For foreign currency qualifying net investment hedges, changes in the fair value of the derivatives are recorded in the translation adjustments account within AOCI.

The following table outlines JPMorgan Chase Bank, N.A.'s primary uses of derivatives and the related hedge accounting designation or disclosure category.

Type of Derivative	Use of Derivative	Designation and disclosure	Page reference
Manage specifically identified risk exposures in qualifying hedge accounting relationships:			
• Interest rate	Hedge fixed rate assets and liabilities	Fair value hedge	51
• Interest rate	Hedge floating-rate assets and liabilities	Cash flow hedge	52
• Foreign exchange	Hedge foreign currency-denominated assets and liabilities	Fair value hedge	51
• Foreign exchange	Hedge foreign currency-denominated forecasted revenue and expense	Cash flow hedge	52
• Foreign exchange	Hedge the value of JPMorgan Chase Bank, N.A.'s investments in non-U.S. subsidiaries	Net investment hedge	53
• Commodity	Hedge commodity inventory	Fair value hedge	51
Manage specifically identified risk exposures not designated in qualifying hedge accounting relationships:			
• Interest rate	Manage the risk of the mortgage pipeline, warehouse loans and MSRs	Specified risk management	53
• Credit	Manage the credit risk of wholesale lending exposures	Specified risk management	53
• Interest rate and foreign exchange	Manage the risk of certain other specified assets and liabilities	Specified risk management	53
Market-making derivatives and other activities:			
• Various	Market-making and related risk management	Market-making and other	53
• Various	Other derivatives	Market-making and other	53

Notional amount of derivative contracts

The following table summarizes the notional amount of derivative contracts outstanding as of December 31, 2017 and 2016.

	Notional amounts[b]	
December 31, (in billions)	**2017**	2016
Interest rate contracts		
Swaps	**$ 21,371**	$ 22,261
Futures and forwards	**4,519**	4,917
Written options	**3,582**	3,101
Purchased options	**4,003**	3,514
Total interest rate contracts	**33,475**	33,793
Credit derivatives[a]	**1,498**	2,010
Foreign exchange contracts		
Cross-currency swaps	**3,978**	3,379
Spot, futures and forwards	**5,962**	5,385
Written options	**788**	735
Purchased options	**777**	721
Total foreign exchange contracts	**11,505**	10,220
Equity contracts		
Swaps	**497**	360
Futures and forwards	**75**	47
Written options	**543**	442
Purchased options	**508**	415
Total equity contracts	**1,623**	1,264
Commodity contracts		
Swaps	**516**	448
Spot, futures and forwards	**173**	131
Written options	**113**	98
Purchased options	**106**	109
Total commodity contracts	**908**	786
Total derivative notional amounts	**$ 49,009**	$ 48,073

(a) For more information on volumes and types of credit derivative contracts, see the Credit derivatives discussion on pages 53–56.
(b) Represents the sum of gross long and gross short notional derivative contracts with third-parties and JPMorgan Chase affiliates. For additional information on related party derivatives, see Note 20.

While the notional amounts disclosed above give an indication of the volume of JPMorgan Chase Bank, N.A.'s derivatives activity, the notional amounts significantly exceed, in JPMorgan Chase Bank, N.A.'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 balance sheets

The tables below include derivative receivables and payables with affiliates on a net basis. See Note 20 for information regarding our derivative activities with affiliates.

The following table summarizes information on derivative receivables and payables (before and after netting adjustments) that are reflected on JPMorgan Chase Bank, N.A.'s Consolidated balance sheets as of December 31, 2017 and 2016, by accounting designation (e.g., whether the derivatives were designated in qualifying hedge accounting relationships or not) and contract type.

Gross derivative balances as of December 31, 2017, reflect JPMorgan Chase Bank, N.A.'s adoption of rulebook changes made by two CCPs, that require or allow JPMorgan Chase Bank, N.A. to treat certain OTC-cleared derivative transactions with that CCP as settled each day. If such rulebook changes had been in effect as of December 31, 2016, the impact would have been a reduction in gross derivative receivables and payables of $227.1 billion and $224.7 billion, respectively, and a corresponding decrease in amounts netted, with no impact to the Consolidated balance sheets.

Free-standing derivative receivables and payables[(a)]

December 31, 2017 (in millions)	Gross derivative receivables: Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables[(b)]	Gross derivative payables: Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables[(b)]
Trading assets and liabilities								
Interest rate	**$ 319,044**	**$ 838**	**$ 319,882**	**$ 24,442**	**$ 289,658**	**$ 92**	**$ 289,750**	**$ 7,014**
Credit	**22,195**	**–**	**22,195**	**714**	**22,268**	**–**	**22,268**	**1,085**
Foreign exchange	**160,914**	**359**	**161,273**	**16,058**	**155,837**	**962**	**156,799**	**12,598**
Equity	**57,507**	**–**	**57,507**	**7,103**	**63,186**	**–**	**63,186**	**9,251**
Commodity	**40,085**	**19**	**40,104**	**6,308**	**40,433**	**403**	**40,836**	**6,321**
Total fair value of trading assets and liabilities	**$ 599,745**	**$ 1,216**	**$ 600,961**	**$ 54,625**	**$ 571,382**	**$ 1,457**	**$ 572,839**	**$ 36,269**

December 31, 2016 (in millions)	Gross derivative receivables: Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables[(b)]	Gross derivative payables: Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables[(b)]
Trading assets and liabilities								
Interest rate	$ 608,615	$ 1,725	$ 610,340	$ 28,020	$ 575,626	$ 1,520	$ 577,146	$ 10,545
Credit	29,149	–	29,149	1,233	28,336	–	28,336	1,298
Foreign exchange	234,301	1,297	235,598	23,319	235,409	490	235,899	20,466
Equity	50,905	–	50,905	5,026	54,839	–	54,839	8,532
Commodity	35,287	3	35,290	6,320	35,268	1	35,269	7,794
Total fair value of trading assets and liabilities	$ 958,257	$ 3,025	$ 961,282	$ 63,918	$ 929,478	$ 2,011	$ 931,489	$ 48,635

(a) Balances exclude structured notes for which the fair value option has been elected. See Note 4 for further information.
(b) As permitted under U.S. GAAP, JPMorgan Chase Bank, N.A. 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.

Derivatives netting

The following tables present, as of December 31, 2017 and 2016, gross and net derivative receivables and payables by contract and settlement type. Derivative receivables and payables, as well as the related cash collateral from the same counterparty, have been netted on the Consolidated balance sheets where JPMorgan Chase Bank, N.A. 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 for netting on the Consolidated balance sheets, and those derivative receivables and payables are shown separately in the tables below.

In addition to the cash collateral received and transferred that is presented on a net basis with derivative receivables and payables, JPMorgan Chase Bank, N.A. receives and transfers additional collateral (financial instruments and cash). These amounts mitigate counterparty credit risk associated with JPMorgan Chase Bank, N.A.'s derivative instruments, but are not eligible for net presentation:

- collateral that consists of non-cash financial instruments (generally U.S. government and agency securities and other G7 government securities) and cash collateral held at third party custodians, which are shown separately as "Collateral not nettable on the Consolidated balance sheets" in the tables below, up to the fair value exposure amount.
- the amount of collateral held or transferred that exceeds the fair value exposure at the individual counterparty level, as of the date presented, which is excluded from the tables below; and
- collateral held or transferred that 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, which is excluded from the tables below.

	2017			2016		
December 31, (in millions)	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables
U.S. GAAP nettable derivative receivables						
Interest rate contracts:						
OTC	**$ 309,464**	**$ (289,039)**	**$ 20,425**	$ 368,159	$ (347,647)	$ 20,512
OTC–cleared	**6,531**	**(6,318)**	**213**	234,525	(234,446)	79
Exchange-traded[(a)]	**185**	**(84)**	**101**	241	(227)	14
Total interest rate contracts	**316,180**	**(295,441)**	**20,739**	602,925	(582,320)	20,605
Credit contracts:						
OTC	**14,393**	**(14,311)**	**82**	22,638	(22,177)	461
OTC–cleared	**7,225**	**(7,170)**	**55**	5,746	(5,739)	7
Total credit contracts	**21,618**	**(21,481)**	**137**	28,384	(27,916)	468
Foreign exchange contracts:						
OTC	**156,415**	**(143,554)**	**12,861**	228,427	(211,087)	17,340
OTC–cleared	**1,696**	**(1,654)**	**42**	1,238	(1,165)	73
Exchange-traded[(a)]	**141**	**(7)**	**134**	104	(27)	77
Total foreign exchange contracts	**158,252**	**(145,215)**	**13,037**	229,769	(212,279)	17,490
Equity contracts:						
OTC	**43,606**	**(41,322)**	**2,284**	39,097	(38,298)	799
Exchange-traded[(a)]	**10,072**	**(9,081)**	**991**	9,075	(7,581)	1,494
Total equity contracts	**53,678**	**(50,403)**	**3,275**	48,172	(45,879)	2,293
Commodity contracts:						
OTC	**30,971**	**(25,096)**	**5,875**	28,255	(22,206)	6,049
Exchange-traded[(a)]	**8,853**	**(8,700)**	**153**	6,792	(6,764)	28
Total commodity contracts	**39,824**	**(33,796)**	**6,028**	35,047	(28,970)	6,077
Derivative receivables with appropriate legal opinion	**$ 589,552**	**$ (546,336)** [(b)]	**$ 43,216**	$ 944,297	$ (897,364) [(b)]	$ 46,933
Derivative receivables where an appropriate legal opinion has not been either sought or obtained	**11,409**		**11,409**	16,985		16,985
Total derivative receivables recognized on the Consolidated balance sheets	**$ 600,961**		**$ 54,625**	$ 961,282		$ 63,918
Collateral not nettable on the Consolidated balance sheets[(c)(d)]			**(13,234)**			(18,594)
Net amounts			**$ 41,391**			$ 45,324

December 31, (in millions)	2017 Gross derivative payables	2017 Amounts netted on the Consolidated balance sheets	2017 Net derivative payables	2016 Gross derivative payables	2016 Amounts netted on the Consolidated balance sheets	2016 Net derivative payables
U.S. GAAP nettable derivative payables						
Interest rate contracts:						
OTC	**$ 282,317**	**$ (276,723)**	**$ 5,594**	$ 345,931	$ (336,778)	$ 9,153
OTC–cleared	**6,005**	**(5,929)**	**76**	229,649	(229,648)	1
Exchange-traded[(a)]	**127**	**(84)**	**43**	196	(175)	21
Total interest rate contracts	**288,449**	**(282,736)**	**5,713**	575,776	(566,601)	9,175
Credit contracts:						
OTC	**15,209**	**(14,398)**	**811**	21,944	(21,397)	547
OTC–cleared	**6,801**	**(6,784)**	**17**	5,641	(5,641)	–
Total credit contracts	**22,010**	**(21,182)**	**828**	27,585	(27,038)	547
Foreign exchange contracts:						
OTC	**151,968**	**(142,641)**	**9,327**	229,290	(214,266)	15,024
OTC–cleared	**1,555**	**(1,553)**	**2**	1,158	(1,158)	–
Exchange-traded[(a)]	**98**	**(7)**	**91**	328	(9)	319
Total foreign exchange contracts	**153,621**	**(144,201)**	**9,420**	230,776	(215,433)	15,343
Equity contracts:						
OTC	**49,146**	**(44,861)**	**4,285**	43,013	(38,743)	4,270
Exchange-traded[(a)]	**9,560**	**(9,074)**	**486**	8,154	(7,564)	590
Total equity contracts	**58,706**	**(53,935)**	**4,771**	51,167	(46,307)	4,860
Commodity contracts:						
OTC	**31,614**	**(25,807)**	**5,807**	27,729	(20,624)	7,105
Exchange-traded[(a)]	**8,855**	**(8,709)**	**146**	7,089	(6,851)	238
Total commodity contracts	**40,469**	**(34,516)**	**5,953**	34,818	(27,475)	7,343
Derivative payables with appropriate legal opinion	**$ 563,255**	**$ (536,570)** [(b)]	**$ 26,685**	$ 920,122	$ (882,854) [(b)]	$ 37,268
Derivative payables where an appropriate legal opinion has not been either sought or obtained	**9,584**		**9,584**	11,367		11,367
Total derivative payables recognized on the Consolidated balance sheets	**$ 572,839**		**$ 36,269**	$ 931,489		$ 48,635
Collateral not nettable on the Consolidated balance sheets[(c)(d)]			**(4,180)**			(8,926)
Net amounts			**$ 32,089**			$ 39,709

(a) Exchange-traded derivative balances that relate to futures contracts are settled daily.

(b) Net derivatives receivable included cash collateral netted of $55.9 billion and $71.4 billion at December 31, 2017 and 2016, respectively. Net derivatives payable included cash collateral netted of $46.1 billion and $56.9 billion related to OTC and OTC-cleared derivatives at December 31, 2017 and 2016, respectively.

(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 collateral relates only to OTC and OTC-cleared derivative instruments.

Liquidity risk and credit-related contingent features

In addition to the specific market risks introduced by each derivative contract type, derivatives expose JPMorgan Chase Bank, N.A. 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 JPMorgan Chase Bank, N.A. proves to be of insufficient value to cover the payment obligation. It is the policy of JPMorgan Chase Bank, N.A. to actively pursue, where possible, the use of legally enforceable master netting arrangements and collateral agreements to mitigate derivative counterparty credit risk. The amount of derivative receivables reported on the Consolidated balance sheets is the fair value of the derivative contracts after giving effect to legally enforceable master netting agreements and cash collateral held by JPMorgan Chase Bank, N.A.

While derivative receivables expose JPMorgan Chase Bank, N.A. to credit risk, derivative payables expose JPMorgan Chase Bank, N.A. to liquidity risk, as the derivative contracts typically require JPMorgan Chase Bank, N.A. to post cash or securities collateral with counterparties as the fair value of the contracts moves in the counterparties' favor or upon specified downgrades in JPMorgan Chase Bank, N.A.'s and its subsidiaries' respective credit ratings. Certain derivative contracts also provide for termination of the contract, generally upon a downgrade of either JPMorgan Chase Bank, N.A. or the counterparty, at the fair value of the derivative contracts. The following table shows the aggregate fair value of net derivative payables related to OTC and OTC-cleared derivatives that contain contingent collateral or termination features that may be triggered upon a ratings downgrade, and the associated collateral JPMorgan Chase Bank, N.A. has posted in the normal course of business, at December 31, 2017 and 2016.

OTC and OTC-cleared derivative payables containing downgrade triggers

December 31, (in millions)	**2017**	2016
Aggregate fair value of net derivative payables	**$ 11,669**	$ 21,200
Collateral posted	**9,947**	19,195

The following table shows the impact of a single-notch and two-notch downgrade of the long-term issuer ratings of JPMorgan Chase Bank, N.A. and its subsidiaries at December 31, 2017 and 2016, related to OTC and OTC-cleared derivative contracts with contingent collateral or termination features that may be triggered upon a ratings downgrade. Derivatives contracts generally require additional collateral to be posted or terminations to be triggered when the predefined threshold rating is breached. A downgrade by a single rating agency that does not result in a rating lower than a preexisting corresponding rating provided by another major rating agency will generally not result in additional collateral (except in certain instances in which additional initial margin may be required upon a ratings downgrade), nor in termination payments requirements. The liquidity impact in the table is calculated based upon a downgrade below the lowest current rating of the rating agencies referred to in the derivative contract.

Liquidity impact of downgrade triggers on OTC and OTC-cleared derivatives

	2017		2016	
December 31, (in millions)	Single-notch downgrade	Two-notch downgrade	Single-notch downgrade	Two-notch downgrade
Amount of additional collateral to be posted upon downgrade[(a)]	**$ 79**	**$ 1,982**	$ 560	$ 2,489
Amount required to settle contracts with termination triggers upon downgrade[(b)]	**320**	**649**	606	1,049

(a) Includes the additional collateral to be posted for initial margin.
(b) Amounts represent fair values of derivative payables, and do not reflect collateral posted.

Derivatives executed in contemplation of a sale of the underlying financial asset

In certain instances JPMorgan Chase Bank, N.A. enters into transactions in which it transfers financial assets but maintains the economic exposure to the transferred assets by entering into a derivative with the same counterparty in contemplation of the initial transfer. JPMorgan Chase Bank, N.A. generally accounts for such transfers as collateralized financing transactions as described in Note 12, but in limited circumstances they may qualify to be accounted for as a sale and a derivative under U.S. GAAP. There were no such transfers accounted for as a sale where the associated derivative was outstanding at December 31, 2017, and such transfers at December 31, 2016 were not material.

Impact of derivatives on the Consolidated statements of income

The following tables provide information related to gains and losses recorded on derivatives based on their hedge accounting designation or purpose. See Note 20 for information regarding our derivative activities with affiliates.

Fair value hedge gains and losses

The following tables present derivative instruments, by contract type, used in fair value hedge accounting relationships, as well as pre-tax gains/(losses) recorded on such derivatives and the related hedged items for the years ended December 31, 2017, 2016 and 2015, respectively. JPMorgan Chase Bank, N.A. includes gains/(losses) on the hedging derivative and the related hedged item in the same line item in the Consolidated statements of income.

	Gains/(losses) recorded in income			Income statement impact due to:	
Year ended December 31, 2017 (in millions)	Derivatives	Hedged items	Total income statement impact	Hedge ineffectiveness[e]	Excluded components[f]
Contract type					
Interest rate[a][b]	**$ 52**	**$ (253)**	**$ (201)**	**$ 2**	**$ (203)**
Foreign exchange[c]	**(3,159)**	**3,523**	**364**	**–**	**364**
Commodity[d]	**(85)**	**96**	**11**	**–**	**11**
Total	**$ (3,192)**	**$ 3,366**	**$ 174**	**$ 2**	**$ 172**

	Gains/(losses) recorded in income			Income statement impact due to:	
Year ended December 31, 2016 (in millions)	Derivatives	Hedged items	Total income statement impact	Hedge ineffectiveness[e]	Excluded components[f]
Contract type					
Interest rate[a][b]	$ 435	$ (706)	$ (271)	$ 2	$ (273)
Foreign exchange[c]	2,556	(2,258)	298	–	298
Commodity[d]	(81)	96	15	–	15
Total	$ 2,910	$ (2,868)	$ 42	$ 2	$ 40

	Gains/(losses) recorded in income			Income statement impact due to:	
Year ended December 31, 2015 (in millions)	Derivatives	Hedged items	Total income statement impact	Hedge ineffectiveness[e]	Excluded components[f]
Contract type					
Interest rate[a][b]	$ (123)	$ (233)	$ (356)	$ 26	$ (382)
Foreign exchange[c]	6,900	(6,921)	(21)	–	(21)
Commodity[d]	600	(638)	(38)	(11)	(27)
Total	$ 7,377	$ (7,792)	$ (415)	$ 15	$ (430)

(a) Primarily consists of hedges of the benchmark (e.g., London Interbank Offered Rate ("LIBOR")) interest rate risk of fixed-rate AFS securities. Gains and losses were recorded in net interest income.
(b) Excludes the amortization expense associated with the inception hedge accounting adjustment applied to the hedged item. This expense is recorded in net interest income and substantially offsets the income statement impact of the excluded components.
(c) Primarily consists of hedges of the foreign currency risk of AFS securities for changes in spot foreign currency rates. Gains and losses related to the derivatives and the hedged items, due to changes in foreign currency rates, were recorded primarily in principal transactions revenue and net interest income.
(d) Consists of overall fair value hedges of physical commodities inventories that are generally carried at the lower of cost or net realizable value (net realizable value approximates fair value). Gains and losses were recorded in principal transactions revenue.
(e) Hedge ineffectiveness is the amount by which the gain or loss on the designated derivative instrument does not exactly offset the gain or loss on the hedged item attributable to the hedged risk.
(f) The assessment of hedge effectiveness excludes certain components of the changes in fair values of the derivatives and hedged items such as forward points on foreign exchange forward contracts and time values.

Cash flow hedge gains and losses

The following tables present derivative instruments, by contract type, used in cash flow hedge accounting relationships, and the pre-tax gains/(losses) recorded on such derivatives, for the years ended December 31, 2017, 2016 and 2015, respectively. JPMorgan Chase Bank, N.A. includes the gain/(loss) on the hedging derivative and the change in cash flows on the hedged item in the same line item in the Consolidated statements of income.

	Gains/(losses) recorded in income and other comprehensive income/(loss)				
Year ended December 31, 2017 (in millions)	Derivatives – effective portion reclassified from AOCI to income	Hedge ineffectiveness recorded directly in income[c]	Total income statement impact	Derivatives – effective portion recorded in OCI	Total change in OCI for period
Contract type					
Interest rate[a]	**$ (17)**	**$ –**	**$ (17)**	**$ 12**	**$ 29**
Foreign exchange[b]	**(117)**	**–**	**(117)**	**135**	**252**
Total	**$ (134)**	**$ –**	**$ (134)**	**$ 147**	**$ 281**

	Gains/(losses) recorded in income and other comprehensive income/(loss)				
Year ended December 31, 2016 (in millions)	Derivatives – effective portion reclassified from AOCI to income	Hedge ineffectiveness recorded directly in income[c]	Total income statement impact	Derivatives – effective portion recorded in OCI	Total change in OCI for period
Contract type					
Interest rate[a]	$ (74)	$ –	$ (74)	$ (55)	$ 19
Foreign exchange[b]	(286)	–	(286)	(394)	(108)
Total	$ (360)	$ –	$ (360)	$ (449)	$ (89)

	Gains/(losses) recorded in income and other comprehensive income/(loss)				
Year ended December 31, 2015 (in millions)	Derivatives – effective portion reclassified from AOCI to income	Hedge ineffectiveness recorded directly in income[c]	Total income statement impact	Derivatives – effective portion recorded in OCI	Total change in OCI for period
Contract type					
Interest rate[a]	$ (93)	$ –	$ (93)	$ (44)	$ 49
Foreign exchange[b]	(81)	–	(81)	(53)	28
Total	$ (174)	$ –	$ (174)	$ (97)	$ 77

(a) Primarily consists of benchmark interest rate hedges of LIBOR-indexed floating-rate assets and floating-rate liabilities. Gains and losses were recorded in net interest income.
(b) Primarily consists of hedges of the foreign currency risk of non-U.S. dollar-denominated revenue and expense. The income statement classification of gains and losses follows the hedged item – primarily noninterest revenue and compensation expense.
(c) Hedge ineffectiveness is the amount by which the cumulative gain or loss on the designated derivative instrument exceeds the present value of the cumulative expected change in cash flows on the hedged item attributable to the hedged risk.

JPMorgan Chase Bank, N.A. did not experience any forecasted transactions that failed to occur for the years ended 2017 and 2016. In 2015, JPMorgan Chase Bank, N.A. reclassified approximately $150 million of net losses from AOCI to other income because JPMorgan Chase Bank, N.A. determined that it was probable that the forecasted interest payment cash flows would not occur as a result of the planned reduction in wholesale non-operating deposits.

Over the next 12 months, JPMorgan Chase Bank, N.A. expects that approximately $96 million (after-tax) of net gains recorded in AOCI at December 31, 2017, related to cash flow hedges will be recognized in income. For terminated cash flow hedges, the maximum length of time over which forecasted transactions are remaining is approximately five years. For open cash flow hedges, the maximum length of time over which forecasted transactions are hedged is approximately seven years. JPMorgan Chase Bank, N.A.'s longer-dated forecasted transactions relate to core lending and borrowing activities.

Net investment hedge gains and losses

The following table presents hedging instruments, by contract type, that were used in net investment hedge accounting relationships, and the pre-tax gains/(losses) recorded on such instruments for the years ended December 31, 2017, 2016 and 2015.

	Gains/(losses) recorded in income and other comprehensive income/(loss)					
	2017		2016		2015	
Year ended December 31, (in millions)	Excluded components recorded directly in income[(a)]	Effective portion recorded in OCI	Excluded components recorded directly in income[(a)]	Effective portion recorded in OCI	Excluded components recorded directly in income[(a)]	Effective portion recorded in OCI
Foreign exchange derivatives	**$ (172)**	**$ (847)**	$ (247)	$ (109)	$ (317)	$ 1,541

(a) Certain components of hedging derivatives are permitted to be excluded from the assessment of hedge effectiveness, such as forward points on foreign exchange forward contracts. Amounts related to excluded components are recorded in other income. JPMorgan Chase Bank, N.A. measures the ineffectiveness of net investment hedge accounting relationships based on changes in spot foreign currency rates, and therefore there was no significant ineffectiveness for net investment hedge accounting relationships during 2017, 2016 and 2015.

Gains and losses on derivatives used for specified risk management purposes

The following table presents pre-tax gains/(losses) recorded on a limited number of derivatives, not designated in hedge accounting relationships, that are used to manage risks associated with certain specified assets and liabilities, including certain risks arising from the mortgage pipeline, warehouse loans, MSRs, wholesale lending exposures and foreign currency denominated assets and liabilities.

	Derivatives gains/(losses) recorded in income		
Year ended December 31, (in millions)	**2017**	2016	2015
Contract type			
Interest rate[(a)]	**$ 331**	$ 1,174	$ 853
Credit[(b)]	**(74)**	(283)	70
Foreign exchange[(c)]	**(40)**	34	17
Total	**$ 217**	$ 925	$ 940

(a) Primarily represents interest rate derivatives used to hedge the interest rate risk inherent in the mortgage pipeline, warehouse loans and MSRs, as well as written commitments to originate warehouse loans. Gains and losses were recorded predominantly in mortgage fees and related income.

(b) Relates to credit derivatives used to mitigate credit risk associated with lending exposures in JPMorgan Chase Bank, N.A.'s wholesale businesses. These derivatives do not include credit derivatives used to mitigate counterparty credit risk arising from derivative receivables, which is included in gains and losses on derivatives related to market-making activities and other derivatives. Gains and losses were recorded in principal transactions revenue.

(c) Primarily relates to derivatives used to mitigate foreign exchange risk of specified foreign currency-denominated assets and liabilities. Gains and losses were recorded in principal transactions revenue.

Gains and losses on derivatives related to market-making activities and other derivatives

JPMorgan Chase Bank, N.A. makes markets in derivatives in order to meet the needs of customers and uses derivatives to manage certain risks associated with net open risk positions from its market-making activities, including the counterparty credit risk arising from derivative receivables. All derivatives not included in the hedge accounting or specified risk management categories above are included in this category. Gains and losses on these derivatives are primarily recorded in principal transactions revenue. See Note 7 for information on principal transactions revenue.

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.

JPMorgan Chase Bank, N.A. is both a purchaser and seller of protection in the credit derivatives market and uses these derivatives for two primary purposes. First, in its capacity as a market-maker, JPMorgan Chase Bank, N.A. actively manages a portfolio of credit derivatives by purchasing and selling credit protection, predominantly on corporate debt obligations, to meet the needs of customers. Second, as an end-user, JPMorgan Chase Bank, N.A. uses credit derivatives to manage credit risk associated with lending exposures (loans and unfunded commitments) and derivatives counterparty exposures in JPMorgan Chase Bank, N.A.'s wholesale businesses, and to manage the credit risk arising from certain financial instruments in JPMorgan Chase Bank, N.A.'s market-making businesses. Following is a summary of various types of credit derivatives.

Credit default swaps

Credit derivatives may reference the credit of either a single reference entity ("single-name") or a broad-based index. JPMorgan Chase Bank, N.A. purchases and sells protection on both single- name and index-reference obligations. Single-name CDS and index CDS contracts are either OTC or 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 consists of 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.

Credit-related notes

A credit-related note is a funded credit derivative where the issuer of the credit-related note purchases from the note investor credit protection on a reference entity or an index. Under the contract, the investor pays the issuer the par value of the note at the inception of the transaction, and in return, the issuer pays periodic payments to the investor, based on the credit risk of the referenced entity. The issuer also repays the investor the par value of the note at maturity unless the reference entity (or one of the entities that makes up a reference index) experiences a specified credit event. If a credit event occurs, the issuer is not obligated to repay the par value of the note, but rather, the issuer pays the investor the difference between the par value of the note and the fair value of the defaulted reference obligation at the time of settlement. Neither party to the credit-related note has recourse to the defaulting reference entity.

The following tables present a summary of the notional amounts of credit derivatives and credit-related notes JPMorgan Chase Bank, N.A. sold and purchased as of December 31, 2017 and 2016. Upon a credit event, JPMorgan Chase Bank, N.A. as a seller of protection would typically pay out only a percentage of the full notional amount of net protection sold, as the amount actually required to be paid on the contracts takes into account the recovery value of the reference obligation at the time of settlement. JPMorgan Chase Bank, N.A. manages the credit risk on contracts to sell protection by purchasing protection with identical or similar underlying reference entities. Other purchased protection referenced in the following tables includes credit derivatives bought on related, but not identical, reference positions (including indices, portfolio coverage and other reference points) as well as protection purchased through credit-related notes.

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

Total credit derivatives and credit-related notes

	Maximum payout/Notional amount			
December 31, 2017 (in millions)	Protection sold	Protection purchased with identical underlyings(b)	Net protection (sold)/ purchased(c)	Other protection purchased(d)
Credit derivatives				
Credit default swaps	**$ (676,017)**	**$ 686,171**	**$ 10,154**	**$ 4,948**
Other credit derivatives(a)	**(59,001)**	**60,595**	**1,594**	**11,747**
Total credit derivatives	**(735,018)**	**746,766**	**11,748**	**16,695**
Credit-related notes	**(18)**	**–**	**(18)**	**7,906**
Total	**$ (735,036)**	**$ 746,766**	**$ 11,730**	**$ 24,601**

	Maximum payout/Notional amount			
December 31, 2016 (in millions)	Protection sold	Protection purchased with identical underlyings(b)	Net protection (sold)/ purchased(c)	Other protection purchased(d)
Credit derivatives				
Credit default swaps	$ (950,474)	$ 962,598	$ 12,123	$ 7,935
Other credit derivatives(a)	(37,415)	38,671	1,256	13,179
Total credit derivatives	(987,889)	1,001,269	13,379	21,114
Credit-related notes	(36)	–	(36)	4,113
Total	$ (987,925)	$ 1,001,269	$ 13,343	$ 25,227

(a) Other credit derivatives largely consists of credit swap options.

(b) Represents the total 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 JPMorgan Chase Bank, N.A. on referenced instruments (single-name, portfolio or index) where JPMorgan Chase Bank, N.A. has not sold any protection on the identical reference instrument.

The following tables summarize the notional amounts by the ratings, maturity profile, and total fair value, of credit derivatives and credit-related notes as of December 31, 2017 and 2016, where JPMorgan Chase Bank, N.A. 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 and credit-related notes where JPMorgan Chase Bank, N.A. is the purchaser of protection are comparable to the profile reflected below.

Protection sold – credit derivatives and credit-related notes ratings[(a)]/maturity profile

December 31, 2017 (in millions)	<1 year	1–5 years	>5 years	Total notional amount	Fair value of receivables[(b)]	Fair value of payables[(b)]	Net fair value
Risk rating of reference entity							
Investment-grade	**$ (163,593)**	**$ (320,201)**	**$ (30,463)**	**$ (514,257)**	**$ 8,516**	**$ (858)**	**$ 7,658**
Noninvestment-grade	**(73,687)**	**(134,156)**	**(12,936)**	**(220,779)**	**7,391**	**(4,638)**	**2,753**
Total	**$ (237,280)**	**$ (454,357)**	**$ (43,399)**	**$ (735,036)**	**$ 15,907**	**$ (5,496)**	**$ 10,411**

December 31, 2016 (in millions)	<1 year	1–5 years	>5 years	Total notional amount	Fair value of receivables[(b)]	Fair value of payables[(b)]	Net fair value
Risk rating of reference entity							
Investment-grade	$ (274,489)	$ (383,580)	$ (34,440)	$ (692,509)	$ 7,838	$ (2,981)	$ 4,857
Noninvestment-grade	(107,933)	(170,021)	(17,462)	(295,416)	8,175	(8,255)	(80)
Total	$ (382,422)	$ (553,601)	$ (51,902)	$ (987,925)	$ 16,013	$ (11,236)	$ 4,777

(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 JPMorgan Chase Bank, N.A.

Note 7 – Noninterest revenue and noninterest expense

Investment banking fees

This revenue category includes debt and equity underwriting and advisory fees. As an underwriter, JPMorgan Chase Bank, N.A. helps clients raise capital via public offering and private placement of various types of debt instruments and equity securities. Underwriting fees are primarily based on the issuance price and quantity of the underlying instruments, and are recognized as revenue typically upon execution of the client's transaction. JPMorgan Chase Bank, N.A. also manages and syndicates loan arrangements. Credit arrangement and syndication fees, included within debt underwriting fees, are recorded as revenue after satisfying certain retention, timing and yield criteria.

JPMorgan Chase Bank, N.A. also provides advisory services, assisting its clients with mergers and acquisitions, divestitures, restructuring and other complex transactions. Advisory fees are recognized as revenue typically upon execution of the client's transaction.

Year ended December 31, (in millions)	**2017**	2016	2015
Underwriting			
Equity	**$ 540**	$ 410	$ 517
Debt	**2,136**	1,722	750
Total underwriting	**2,676**	2,132	1,267
Advisory	**743**	567	664
Total investment banking fees	**$ 3,419**	$ 2,699	$ 1,931

Principal transactions

Principal transactions revenue is driven by many factors, including the bid-offer spread, which is the difference between the price at which JPMorgan Chase Bank, N.A. is willing to buy a financial or other instrument and the price at which JPMorgan Chase Bank, N.A. is willing to sell that instrument. It also consists of the realized (as a result of the sale of instruments, closing out or termination of transactions, or interim cash payments) and unrealized (as a result of changes in valuation) gains and losses on financial and other instruments (including those accounted for under the fair value option) primarily used in client-driven market-making activities and on private equity investments. In connection with its client-driven market-making activities, JPMorgan Chase Bank, N.A. transacts in debt and equity instruments, derivatives and commodities (including physical commodities inventories and financial instruments that reference commodities).

Principal transactions revenue also includes certain realized and unrealized gains and losses related to hedge accounting and specified risk-management activities, including: (a) certain derivatives designated in qualifying hedge accounting relationships (primarily fair value hedges of commodity and foreign exchange risk), (b) certain derivatives used for specific risk management purposes, primarily to mitigate credit risk and foreign exchange risk, and (c) other derivatives. For further information on the income statement classification of gains and losses from derivatives activities, see Note 6.

In the financial commodity markets, JPMorgan Chase Bank, N.A. transacts in OTC derivatives (e.g., swaps, forwards, options) and ETD that reference a wide range of underlying commodities. In the physical commodity markets, JPMorgan Chase Bank, N.A. primarily purchases and sells precious and base metals and may hold other commodities inventories under financing and other arrangements with clients.

The following table presents all realized and unrealized gains and losses recorded in principal transactions revenue. This table excludes interest income and interest expense on trading assets and liabilities, which are an integral part of the overall performance of JPMorgan Chase Bank, N.A.'s client-driven market-making activities. See Note 8 for further information on interest income and interest expense. Trading revenue is presented primarily by instrument type. JPMorgan Chase Bank, N.A.'s client-driven market-making businesses generally utilize a variety of instrument types in connection with their market-making and related risk-management activities; accordingly, the trading revenue presented in the table below is not representative of the total revenue of any individual line of business.

Year ended December 31, (in millions)	2017	2016	2015
Trading revenue by instrument type			
Interest rate	**$ 3,200**	$ 2,841	$ 2,782
Credit	**653**	1,229	930
Foreign exchange	**2,826**	2,944	2,700
Equity	**2,784**	2,357	2,043
Commodity	**415**	504	610
Total trading revenue	**9,878**	9,875	9,065
Private equity gains	**2**	88	20
Principal transactions	**$ 9,880**	$ 9,963	$ 9,085

Lending- and deposit-related fees

Lending-related fees include fees earned from loan commitments, standby letters of credit, financial guarantees, and other loan-servicing activities. Deposit-related fees include fees earned in lieu of compensating balances, and fees earned from performing cash management activities and other deposit account services. Lending- and deposit-related fees in this revenue category are recognized over the period in which the related service is provided.

Year ended December 31, (in millions)	2017	2016	2015
Lending-related fees	**$ 1,117**	$ 1,121	$ 1,148
Deposit-related fees	**4,823**	4,659	4,545
Total lending- and deposit-related fees	**$ 5,940**	$ 5,780	$ 5,693

Asset management, administration and commissions

This revenue category includes fees from investment management and related services, custody, brokerage services and other products. JPMorgan Chase Bank, N.A. manages assets on behalf of its clients, including investors in JPMorgan Chase Bank, N.A.-sponsored funds and owners of separately managed investment accounts. Management fees are typically based on the value of assets under management and are collected and recognized at the end of each period over which the management services are provided and the value of the managed assets is known. JPMorgan Chase Bank, N.A. also receives performance-based management fees, which are earned based on exceeding certain benchmarks or other performance targets and are accrued and recognized when the probability of reversal is remote, typically at the end of the related billing period. JPMorgan Chase Bank, N.A. has contractual arrangements with third parties to provide distribution and other services in connection with its asset management activities. Amounts paid to third-party service providers are recorded in professional and outside services expense.

Year ended December 31, (in millions)	2017	2016	2015
Asset management fees			
Investment management fees	**$ 2,039**	$ 1,994	$ 2,086
All other asset management fees[(a)]	**52**	58	40
Total asset management fees	**2,091**	2,052	2,126
Total administration fees[(b)]	**2,026**	1,914	2,027
Commissions and other fees			
Brokerage commissions[(c)]	**1,115**	982	1,033
All other commissions and fees	**6,498**	6,185	6,077
Total commissions and fees	**7,613**	7,167	7,110
Total asset management, administration and commissions	**$ 11,730**	$ 11,133	$ 11,263

(a) JPMorgan Chase Bank, N.A. receives other asset management fees for services that are ancillary to investment management services, including commissions earned on sales or distribution of mutual funds to clients. These fees are recorded as revenue at the time the service is rendered or, in the case of certain distribution fees based on the underlying fund's asset value and/or investor redemption, recorded over time as the investor remains in the fund or upon investor redemption.
(b) JPMorgan Chase Bank, N.A. receives administrative fees predominantly from custody, securities lending, fund services and securities clearance fees. These fees are recorded as revenue over the period in which the related service is provided.
(c) JPMorgan Chase Bank, N.A. acts as a broker, facilitating its clients' purchase and sale of securities and other financial instruments. It collects and recognizes brokerage commissions as revenue upon occurrence of the client transaction. JPMorgan Chase Bank, N.A. reports certain costs paid to third-party clearing houses and exchanges net against commission revenue.

In addition, included in all other commissions and fees are fees earned by JPMorgan Chase Bank, N.A. for providing operational support and services to JPMorgan Chase and its subsidiaries. See Note 20 for further information on related party transactions.

Mortgage fees and related income

This revenue category primarily reflects the consumer & community banking business's home lending production and servicing revenue, including fees and income derived from mortgages originated with the intent to sell; mortgage sales and servicing including losses related to the repurchase of previously sold loans; the impact of risk-management activities associated with the mortgage pipeline, warehouse loans and MSRs; and revenue related to any residual interests held from mortgage securitizations. This revenue category also includes gains and losses on sales and lower of cost or fair value adjustments for mortgage loans held-for-sale, as well as changes in fair value for mortgage loans originated with the intent to sell and measured at fair value under the fair value option. Changes in the fair value of MSRs are reported in mortgage fees and related income. For a further discussion of MSRs, see Note 16. Net interest income from mortgage loans is recorded in interest income.

Card income

This revenue category includes interchange income from credit and debit cards and fees earned from processing card transactions for merchants, both of which are recognized when purchases are made by a cardholder. Card income also includes other lending fees and related costs. The card income earned by JPMorgan Chase Bank, N.A. results from activity in the merchant services business and from a participation arrangement with a bank affiliate of JPMorgan Chase Bank, N.A.

Other income

Other income on JPMorgan Chase Bank, N.A.'s Consolidated statements of income included the following:

Year ended December 31, (in millions)	**2017**	2016	2015
Operating lease income	**$ 3,605**	$ 2,714	$ 2,075

Operating lease income is recognized on a straight-line basis over the lease term.

Noninterest expense

Other expense

Other expense on JPMorgan Chase Bank, N.A.'s Consolidated statements of income included the following:

Year ended December 31, (in millions)	**2017**	2016	2015
Legal expense/(benefit)	**$ (139)**	$ (289)	$ 2,035
Federal Deposit Insurance Corporation ("FDIC")-related expense	**1,396**	1,217	1,157

Note 8 – Interest income and Interest expense

Interest income and interest expense are recorded in the Consolidated statements of income and classified based on the nature of the underlying asset or liability.

The following table presents the components of interest income and interest expense:

Year ended December 31, (in millions)	2017	2016	2015
Interest income			
Loans	**$30,316**	$26,506	$22,925
Taxable securities	**5,520**	5,519	6,522
Non-taxable securities[(a)]	**1,718**	1,632	1,562
Total securities	**7,238**	7,151	8,084
Trading assets	**4,700**	4,578	4,097
Federal funds sold and securities purchased under resale agreements	**1,252**	1,370	960
Securities borrowed[(b)]	**67**	2	(10)
Deposits with banks	**4,071**	1,753	1,176
All other interest-earning assets	**455**	224	193
Total interest income	**48,099**	41,584	37,425
Interest expense			
Interest-bearing deposits	**3,785**	1,744	1,409
Federal funds purchased and securities loaned or sold under repurchase agreements	**524**	408	253
Trading liabilities - debt, short-term and all other interest-bearing liabilities	**1,366**	1,295	1,311
Long-term debt	**1,299**	1,091	682
Beneficial interests issued by consolidated VIEs	**93**	104	81
Total interest expense	**7,067**	4,642	3,736
Net interest income	**41,032**	36,942	33,689
Provision for credit losses	**1,845**	2,486	1,376
Net interest income after provision for credit losses	**$39,187**	$34,456	$32,313

(a) Represents securities that are tax-exempt for U.S. federal income tax purposes.
(b) Negative interest income is related to client-driven demand for certain securities combined with the impact of low interest rates. This is matched book activity and the negative interest expense on the corresponding securities loaned is recognized in interest expense.

Interest income and interest expense includes the current-period interest accruals for financial instruments measured at fair value, except for derivatives and financial instruments containing embedded derivatives that would be separately accounted for in accordance with U.S. GAAP, absent the fair value option election; for those instruments, all changes in fair value including any interest elements, are reported in principal transactions revenue. For financial instruments that are not measured at fair value, the related interest is included within interest income or interest expense, as applicable. For further information on accounting for interest income and interest expense related to loans, securities, securities financing (i.e. securities purchased or sold under resale or repurchase agreements; securities borrowed; and securities loaned) and long-term debt, see Notes 13, 11, 12 and 19, respectively.

Note 9 – Pension and other postretirement employee benefit plans

JPMorgan Chase Bank, N.A. has various defined benefit pension plans and other postretirement employee benefit ("OPEB") plans that provide benefits to its employees. Substantially all of JPMorgan Chase Bank, N.A.'s U.S. employees are provided pension benefits through JPMorgan Chase's qualified noncontributory U.S. defined benefit pension plan. In addition, JPMorgan Chase Bank, N.A. offers postretirement medical and life insurance benefits to certain U.S. retirees and postretirement medical benefits to qualifying U.S. employees through JPMorgan Chase plans.

Consolidated disclosures of information about the defined benefit pension and OPEB plans of JPMorgan Chase, including the funded status of the plans, components of benefit cost and weighted-average actuarial assumptions are included in Note 8 on pages 195–200 of the 2017 Form 10-K.

JPMorgan Chase Bank, N.A.'s U.S. defined benefit pension expense and postretirement medical benefit expense are determined based upon employee participation in the JPMorgan Chase plans and effected through an intercompany charge from JPMorgan Chase, which is cash settled monthly.

JPMorgan Chase Bank, N.A. was charged $195 million, $180 million and $194 million in 2017, 2016 and 2015, respectively, for its share of the U.S. qualified defined benefit pension plan expense; and it was charged $1 million for each of the years 2017, 2016 and 2015, for its share of the U.S. OPEB plan expense.

JPMorgan Chase Bank, N.A. also offers benefits through defined benefit pension plans to qualifying employees in certain non-U.S. locations.

It is JPMorgan Chase Bank, N.A.'s policy to fund the pension plans in amounts sufficient to meet the requirements under applicable laws. The 2018 contributions to the non-U.S. defined benefit pension plans are expected to be $46 million of which $30 million are contractually required.

JPMorgan Chase Bank, N.A. also offers certain qualifying employees in the U.S. the ability to participate in a number of nonqualified noncontributory defined benefit pension plans that are unfunded. These plans provide supplemental defined pension benefits to certain employees.

JPMorgan Chase Bank, N.A. employees may also participate in one of the two qualified defined contribution plans offered by JPMorgan Chase in the U.S. and other similar arrangements offered by JPMorgan Chase Bank, N.A. in certain non-U.S. locations.

Pension and OPEB accounting generally requires that the difference between plan assets at fair value and the benefit obligation be measured and recorded on the balance sheet. Plans that are overfunded (excess of plan assets over benefit obligation) are recorded in other assets and plans that are underfunded (excess benefit obligation over plan assets) are recorded within other liabilities. Gains or losses resulting from changes in the benefit obligation and the value of plan assets are recorded in other comprehensive income ("OCI") and recognized as part of the net periodic benefit cost over subsequent periods as discussed in the Gains and losses section of this Note. Additionally, service cost, interest cost, and investment returns that would otherwise be classified separately are aggregated and reported net within compensation expense.

The following table presents the changes in benefit obligations, plan assets, the net funded status, and the pre-tax pension amounts recorded in AOCI on the Consolidated balance sheets for JPMorgan Chase Bank, N.A.'s significant defined benefit pension plans, and the weighted-average actuarial annualized assumptions for the projected and accumulated postretirement benefit obligations.

As of or for the year ended December 31, (in millions)	Defined benefit pension plans	
	2017	2016
Change in benefit obligation		
Benefit obligation, beginning of year	**$ (3,490)**	$ (3,462)
Benefits earned during the year	**(29)**	(36)
Interest cost on benefit obligations	**(83)**	(104)
Employee contributions	**(7)**	(7)
Net gain/(loss)	**(127)**	(540)
Benefits paid	**163**	132
Plan settlements	**30**	21
Foreign exchange impact and other	**(314)**	506
Benefit obligation, end of year(a)	**$ (3,857)**	$ (3,490)
Change in plan assets		
Fair value of plan assets, beginning of year	**$ 3,431**	$ 3,511
Actual return on plan assets	**294**	537
JPMorgan Chase Bank, N.A. contributions	**52**	58
Employee contributions	**7**	7
Benefits paid	**(163)**	(132)
Plan settlements	**(30)**	(21)
Foreign exchange impact and other	**330**	(529)
Fair value of plan assets, end of year(a)	**$ 3,921**	$ 3,431
Net funded/(unfunded) status(b)	**$ 64**	$ (59)
Accumulated benefit obligation, end of year	**$ (3,857)**	$ (3,490)
Pretax pension amounts recorded in AOCI		
Net gain/(loss)	**$ (550)**	$ (567)
Prior service credit/(loss)	**6**	8
Accumulated other comprehensive income/(loss), pretax, end of year	**$ (544)**	$ (559)
Weighted-average assumptions used to determine benefit obligations		
Discounted rate(c)	**0.60 - 3.70%**	0.60 - 4.30%
Rate of compensation increase	**2.25 - 3.00**	2.25 - 3.00

(a) At December 31, 2017 and 2016, included U.S. benefit obligation of $(107) million and $(113) million, respectively. There are no assets for the U.S. plans.
(b) Represents plans with an aggregate overfunded balance of $293 million and $204 million at December 31, 2017 and 2016, respectively, and plans with an aggregate underfunded balance of $229 million and $263 million at December 31, 2017 and 2016, respectively.
(c) For the non-U.S. defined benefit pension plans, the discount rate assumption ranges are 0.60 - 2.40% and 0.60 - 2.60% for 2017 and 2016, respectively.

Gains and losses

For JPMorgan Chase Bank, N.A.'s defined benefit pension plans, fair value is used to determine the expected return on plan assets. Amortization of net gains and losses is included in annual net periodic benefit cost if, as of the beginning of the year, the net gain or loss exceeds 10% of the greater of the PBO or the fair value of the plan assets. Any excess is amortized over the average future service period of defined benefit pension plan participants, which for the non-U.S. defined benefit pension plans is the period appropriate for the affected plan. In addition, prior service costs are amortized over the average remaining service period of active employees expected to receive benefits under the plan when the prior service cost is first recognized.

The following table presents the components of net periodic benefit costs reported in the Consolidated statements of income for JPMorgan Chase Bank, N.A.'s significant defined benefit pension and defined contribution plans, and in other comprehensive income for the significant defined benefit pension plans, and the weighted-average annualized actuarial assumptions for the net periodic benefit cost.

	Defined benefit pension plans		
Year ended December 31, (in millions)	**2017**	2016	2015
Components of net periodic benefit cost			
Benefits earned during the year	**$ 29**	$ 36	$ 38
Interest cost on benefit obligations	**83**	104	116
Expected return on plan assets	**(136)**	(139)	(150)
Amortization:			
Net (gain)/loss	**34**	25	40
Prior service cost/(credit)	**(2)**	(2)	(2)
Special termination benefits	**–**	–	1
Settlement loss	**2**	4	–
Net periodic defined benefit cost	**10**	28	43
Other defined benefit pension plans[(a)]	**15**	15	18
Total defined benefit plans	**25**	43	61
Total defined contribution plans	**680**	676	667
Total pension and OPEB cost included in compensation expense	**$ 705**	$ 719	$ 728
Changes in plan assets and benefit obligations recognized in other comprehensive income			
Net (gain)/loss arising during the year	**$ (33)**	$ 139	$ (54)
Amortization of net loss	**(34)**	(25)	(40)
Amortization of prior service (cost)/credit	**2**	2	2
Settlement loss	**(2)**	(4)	–
Foreign exchange impact and other	**52**	(80)	(132)
Total recognized in other comprehensive income	**$ (15)**	$ 32	$ (224)
Total recognized in net periodic benefit cost and other comprehensive income	**$ (5)**	$ 60	$ (181)
Weighted-average assumptions used to determine net periodic benefit costs			
Discount rate[(b)]	**0.60 - 4.30%**	0.90 - 4.50%	1.00 - 4.00%
Expected long-term rate of return on plan assets	**0.70 - 4.30**	0.80 - 4.60	0.90 - 4.80
Rate of compensation increase	**2.25 - 3.00**	2.25 - 4.30	2.75 - 4.20

(a) Includes various defined benefit pension plans which are individually immaterial.

(b) For the non-U.S. defined benefit pension plans, the discount rate assumption ranges are 0.60 - 2.50%, 0.90 - 3.70% and 1.00- 3.60% for 2017, 2016 and 2015, respectively.

The estimated pretax amounts that will be amortized from AOCI into net periodic benefit cost in 2018 are as follows.

(in millions)	Defined benefit pension plans
Net loss/(gain)	**$ 23**
Prior service cost/(credit)	**(2)**
Total	**$ 21**

Plan assumptions

For the U.K. defined benefit pension plans, which represent the most significant of JPMorgan Chase Bank, N.A.'s non-U.S. defined benefit pension plans, procedures are used to develop the expected long-term rate of return on plan assets, taking into consideration local market conditions and the specific allocation of plan assets. The expected long-term rate of return on U.K. plan assets is an average of projected long-term returns for each asset class. The return on equities has been selected by reference to the yield on long-term U.K. government bonds plus an equity risk premium above the risk-free rate. The expected return on "AA" rated long-term corporate bonds is based on an implied yield for similar bonds.

The discount rate for the U.K. defined benefit pension plan represents a rate of appropriate duration from the analysis of yield curves provided by JPMorgan Chase Bank, N.A.'s actuaries.

JPMorgan Chase Bank, N.A.'s non-U.S. defined benefit pension plans expense is sensitive to the discount rate. A 25-basis point decline in the discount rates for the non-U.S. plans would result in an increase in the 2018 non-U.S. defined benefit pension plan expense of approximately $15 million.

Investment strategy and asset allocation

The investment policy for the U.K. defined benefit pension plans, which represent the most significant of the non-U.S. defined benefit pension plans, is to maximize returns subject to an appropriate level of risk relative to the plans' liabilities. To reduce the volatility in returns relative to the plans' liability profiles, the U.K. defined benefit pension plans' largest asset allocations are to debt securities of appropriate durations. Other assets, mainly equity securities, are then invested for capital appreciation, to provide long-term investment growth. Asset allocations and asset managers for the U.K. defined benefit pension plans are reviewed regularly and the portfolios are rebalanced when deemed necessary.

As of December 31, 2017, assets held by JPMorgan Chase Bank, N.A.'s non-U.S. defined benefit pension plans do not include JPMorgan Chase common stock, except through indirect exposures through investments in third-party stock-index funds. The non-U.S. plans hold investments in funds that are sponsored or managed by affiliates of JPMorgan Chase Bank, N.A. in the amount of $1.5 billion and $1.2 billion as of December 31, 2017 and 2016, respectively.

The following table presents the weighted-average asset allocation of the fair values of total plan assets at December 31 for the years indicated, as well as the respective approved asset allocation ranges by asset class, for JPMorgan Chase Bank, N.A.'s non-U.S. defined benefit pension plans.

		% of plan assets	
December 31,	Asset Allocation	**2017**	2016
Asset class			
Debt securities[(a)]	58%	**60%**	60%
Equity securities	40	**38**	39
Real Estate	1	**1**	–
Alternatives	1	**1**	1
Total	100%	**100%**	100%

(a) Debt securities primarily include cash, corporate debt and non-U.S. government debt securities.

Fair value measurement of the plans' assets and liabilities

For information on fair value measurements, including descriptions of level 1 and 2 of the fair value hierarchy and the valuation methods employed by JPMorgan Chase Bank, N.A., see Note 3.

Pension plan assets and liabilities measured at fair value

	Defined benefit pension plans					
	2017			2016		
December 31, (in millions)	Level 1	Level 2	Total fair value	Level 1	Level 2	Total fair value
Cash and cash equivalents	**$ 118**	**$ 1**	**$ 119**	$ 122	$ 2	$ 124
Equity securities	**1,047**	**183**	**1,230**	980	154	1,134
Mutual funds	**87**	**–**	**87**	–	–	–
Common/collective trust funds	**169**	**–**	**169**	118	–	118
Corporate debt securities[a]	**–**	**775**	**775**	–	715	715
Non-U.S. government debt securities	**235**	**696**	**931**	213	570	783
Mortgage-backed securities	**5**	**8**	**13**	3	10	13
Derivative receivables	**–**	**179**	**179**	–	219	219
Other[b]	**155**	**60**	**215**	223	53	276
Total assets measured at fair value[c]	**$ 1,816**	**$ 1,902**	**$ 3,718**	$ 1,659	$ 1,723	$ 3,382
Derivative payables	**$ –**	**$ (131)**	**$ (131)**	$ –	$ (194)	$ (194)
Total liabilities measured at fair value	**$ –**	**$ (131)**	**$ (131)**	$ –	$ (194)	$ (194)

(a) Corporate debt securities include debt securities of U.S. and non-U.S. corporations.

(b) Other consists primarily of money market funds and insurance contracts. Money market funds are primarily classified within level 1 of the fair value hierarchy given they are valued using market observable prices. Insurance contracts are guaranteed return investments subject to the credit risk of the insurance company and are classified in level 2 of the valuation hierarchy.

(c) At December 31, 2017 and 2016, excludes $334 million and $243 million, respectively, of certain non-U.S. defined benefit pension plan investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient, which are not required to be classified in the fair value hierarchy.

Estimated future benefit payments

The following table presents benefit payments expected to be paid, which include the effect of expected future service, for the years indicated.

Year ended December 31, (in millions)	Defined benefit pension plans
2018	$ 125
2019	123
2020	130
2021	135
2022	139
Years 2023-2027	761

Note 10 – Employee share-based incentives

Employee share-based awards

JPMorgan Chase Bank, N.A.'s employees receive annual incentive compensation based on their performance, the performance of their business and JPMorgan Chase's consolidated operating results. JPMorgan Chase Bank, N.A.'s employees participate, to the extent they meet minimum eligibility requirements, in various share-based incentive plans sponsored by JPMorgan Chase. For additional information regarding JPMorgan Chase's employee share-based incentives, see Note 9 on pages 201-202 of the 2017 Form 10-K.

In 2017, 2016 and 2015, JPMorgan Chase granted long-term share-based awards to certain employees under its Long-Term Incentive Plan ("LTIP"), as amended and restated effective May 19, 2015. Under the terms of the LTIP, as of December 31, 2017, 67 million shares of JPMorgan Chase's common stock were available for issuance through May 2019. The LTIP is the only active plan under which JPMorgan Chase is currently granting share-based incentive awards. In the following discussion, the LTIP, plus prior JPMorgan Chase plans and plans assumed as the result of acquisitions, are referred to collectively as the "LTI Plans," and such plans constitute JPMorgan Chase's share-based incentive plans.

Restricted stock units ("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 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 based on age or service-related requirements, subject to post-employment and other restrictions. All RSU awards are subject to forfeiture until vested and contain clawback provisions that may result in cancellation under certain specified circumstances. Generally, RSUs entitle the recipient to receive cash payments equivalent to any dividends paid on the underlying common stock during the period the RSUs are outstanding.

In January 2017 and 2016, JPMorgan Chase's Board of Directors approved the grant of performance share units ("PSUs") to members of JPMorgan Chase's Operating Committee under the variable compensation program for performance years 2016 and 2015. PSUs are subject to JPMorgan Chase's achievement of specified performance criteria over a three-year period. The number of awards that vest can range from zero to 150% of the grant amount. The awards vest and are converted into shares of common stock in the quarter after the end of the performance period, which is generally three years. In addition, dividends are notionally reinvested in JPMorgan Chase's common stock and will be delivered only in respect of any earned shares.

Once the PSUs have vested, the shares of common stock that are delivered, after applicable tax withholding, must be held for an additional two-year period, typically for a total combined vesting and holding period of five years from the grant date.

Under the LTI Plans, stock options and stock appreciation rights ("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 2017, 2016 and 2015. SARs generally expire ten years after the grant date.

JPMorgan Chase Bank, N.A. 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 Bank, N.A. 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.

In January 2008, JPMorgan Chase awarded to its Chairman and Chief Executive Officer up to 2 million SARs. The terms of this award are distinct from, and more restrictive than, other equity grants regularly awarded by JPMorgan Chase. On July 15, 2014, the Compensation & Management Development Committee and Board of Directors determined that all requirements for the vesting of the 2 million SAR awards had been met and thus, the awards became exercisable. The SARs, which had an expiration date of January 2018, were exercised by Mr. Dimon in October 2017 at the exercise price of $39.83 per share (the price of JPMorgan Chase common stock on the date of grant).

RSUs, PSUs, employee stock options and SARs activity

Generally, compensation expense for RSUs and PSUs is measured based on the number of units granted multiplied by the stock price at the grant date, and for employee stock options and SARs, is measured at the grant date using the Black-Scholes valuation model. Compensation expense for these awards is recognized in net income as described previously. The following table summarizes JPMorgan Chase Bank, N.A.'s RSUs, PSUs, employee stock options and SARs activity for 2017.

Year ended December 31, 2017 (in thousands, except weighted-average data, and where otherwise stated)	RSUs/PSUs Number of units	RSUs/PSUs Weighted-average grant date fair value	Options/SARs Number of awards	Options/SARs Weighted-average exercise price	Options/SARs Weighted-average remaining contractual life (in years)	Options/SARs Aggregate intrinsic value
Outstanding, January 1	56,868	$ 57.20	24,975	$ 40.71		
Granted	18,829	84.21	96	90.71		
Exercised or vested	(23,069)	58.08	(10,911)	40.52		
Forfeited	(1,522)	62.58	(48)	56.94		
Canceled	NA	NA	(8)	252.04		
Transferred	238	57.20	222	40.71		
Outstanding, December 31	51,344	$ 66.51	14,326	$ 40.89	3.5	$ 955,826
Exercisable, December 31	NA	NA	12,842	40.07	3.3	867,309

The total fair value of RSUs that vested during the years ended December 31, 2017, 2016 and 2015, was $2.0 billion, $1.5 billion and $1.9 billion, respectively. The total intrinsic value of options exercised during the years ended December 31, 2017, 2016 and 2015, was $553 million, $278 million and $284 million, respectively.

Compensation expense

JPMorgan Chase Bank, N.A. recognized the following compensation expense related to its various employee share-based incentive plans in its Consolidated statements of income.

Year ended December 31, (in millions)	**2017**	2016	2015
Cost of prior grants of RSUs, PSUs and SARs that are amortized over their applicable vesting periods	**$ 802**	$ 705	$ 730
Accrual of estimated costs of share-based awards to be granted in future periods including those to full-career eligible employees	**687**	627	597
Total compensation expense related to employee share-based incentive plans	**$ 1,489**	$ 1,332	$ 1,327

At December 31, 2017, approximately $516 million (pretax) of compensation expense related to unvested awards had not yet been charged to net income. That cost is expected to be amortized into compensation expense over a weighted-average period of 1.1 years. JPMorgan Chase Bank, N.A. does not capitalize any compensation expense related to share-based compensation awards to employees.

Tax benefits

Effective January 1, 2016, JPMorgan Chase adopted new accounting guidance related to employee share-based payments. As a result of the adoption of this new guidance, JPMorgan Chase Bank, N.A. is recognizing its share of excess tax benefits (including tax benefits from dividends or dividend equivalents) on share-based payment awards are recognized within income tax expense in the Consolidated statements of income. Income tax benefits related to share-based incentive arrangements recognized in JPMorgan Chase Bank, N.A.'s Consolidated statements of income for the years ended December 31, 2017, 2016 and 2015, were $739 million, $626 million and $498 million, respectively.

Note 11 – Securities

Securities are classified as trading, AFS or HTM. Securities classified as trading assets are discussed in Note 3. Predominantly all of JPMorgan Chase Bank, N.A.'s AFS and HTM securities are held by the corporate function in connection with its asset-liability management activities. At December 31, 2017, the investment securities portfolio consisted of debt securities with an average credit rating of AA+ (based upon external ratings where available, and where not available, based primarily upon internal ratings which correspond to ratings as defined by S&P and Moody's). AFS securities are carried at fair value on the Consolidated balance sheets. Unrealized gains and losses, after any applicable hedge accounting adjustments, are reported as net increases or decreases to AOCI. The specific identification method is used to determine realized gains and losses on AFS securities, which are included in securities gains/(losses) on the Consolidated statements of income. HTM debt securities, which management has the intent and ability to hold until maturity, are carried at amortized cost on the Consolidated balance sheets. For both AFS and HTM debt securities, purchase discounts or premiums are generally amortized into interest income over the contractual life of the security.

The amortized cost and estimated fair value of the investment securities portfolio were as follows for the dates indicated.

	2017				2016			
December 31, (in millions)	Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value	Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value
Available-for-sale debt securities								
Mortgage-backed securities:								
U.S. government agencies[(a)]	**$ 69,879**	**$ 736**	**$ 335**	**$ 70,280**	$ 63,367	$ 1,112	$ 474	$ 64,005
Residential:								
U.S.[(b)]	**8,193**	**185**	**14**	**8,364**	8,171	100	28	8,243
Non-U.S.	**2,882**	**122**	**1**	**3,003**	6,049	158	7	6,200
Commercial	**4,791**	**94**	**5**	**4,880**	8,602	108	19	8,691
Total mortgage-backed securities	**85,745**	**1,137**	**355**	**86,527**	86,189	1,478	528	87,139
U.S. Treasury and government agencies[(a)]	**22,510**	**266**	**31**	**22,745**	44,822	75	796	44,101
Obligations of U.S. states and municipalities	**28,444**	**1,764**	**33**	**30,175**	27,769	1,311	183	28,897
Certificates of deposit	**59**	**—**	**—**	**59**	106	—	—	106
Non-U.S. government debt securities	**26,900**	**426**	**32**	**27,294**	34,497	836	45	35,288
Corporate debt securities	**2,657**	**101**	**1**	**2,757**	4,916	64	22	4,958
Asset-backed securities:								
Collateralized loan obligations	**20,928**	**69**	**1**	**20,996**	27,352	75	26	27,401
Other	**8,725**	**72**	**24**	**8,773**	6,913	59	46	6,926
Total available-for-sale debt securities	**195,968**	**3,835**	**477**	**199,326**	232,564	3,898	1,646	234,816
Available-for-sale equity securities	**38**	**—**	**—**	**38**	42	12	—	54
Total available-for-sale securities	**$ 196,006**	**$ 3,835**	**$ 477**	**$ 199,364**	$ 232,606	$ 3,910	$ 1,646	$ 234,870
Held-to-maturity debt securities								
Mortgage-backed securities:								
U.S. government agencies[(c)]	**27,577**	**558**	**40**	**28,095**	29,910	638	37	30,511
Commercial	**5,783**	**1**	**74**	**5,710**	5,783	—	129	5,654
Total mortgage-backed securities	**33,360**	**559**	**114**	**33,805**	35,693	638	166	36,165
Obligations of U.S. states and municipalities	**14,373**	**554**	**80**	**14,847**	14,475	374	125	14,724
Total held-to-maturity securities	**47,733**	**1,113**	**194**	**48,652**	50,168	1,012	291	50,889
Total securities	**$ 243,739**	**$ 4,948**	**$ 671**	**$ 248,016**	$ 282,774	$ 4,922	$ 1,937	$ 285,759

(a) Includes total U.S. government-sponsored enterprise obligations with a fair value of $45.8 billion for the years ended December 31, 2017 and 2016, which were predominantly mortgage-related.
(b) Prior period amounts have been revised to conform with the current period presentation.
(c) Included total U S. government-sponsored enterprise obligations with amortized cost of $22.0 billion and $25.6 billion at December 31, 2017 and 2016, respectively, which were mortgage-related.

Securities impairment

The following tables present the fair value and gross unrealized losses for the investment securities portfolio by aging category at December 31, 2017 and 2016.

	Securities with gross unrealized losses					
	Less than 12 months		12 months or more			
December 31, 2017 (in millions)	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses	Total fair value	Total gross unrealized losses
Available-for-sale debt securities						
Mortgage-backed securities:						
U.S. government agencies	$ 36,037	$ 139	$ 7,711	$ 196	$ 43,748	$ 335
Residential:						
U.S.	1,112	5	596	9	1,708	14
Non-U.S.	—	—	266	1	266	1
Commercial	528	4	335	1	863	5
Total mortgage-backed securities	37,677	148	8,908	207	46,585	355
U.S. Treasury and government agencies	1,834	11	373	20	2,207	31
Obligations of U.S. states and municipalities	931	7	1,652	26	2,583	33
Certificates of deposit	—	—	—	—	—	—
Non-U.S. government debt securities	6,500	15	811	17	7,311	32
Corporate debt securities	—	—	52	1	52	1
Asset-backed securities:						
Collateralized loan obligations	—	—	276	1	276	1
Other	3,521	20	720	4	4,241	24
Total available-for-sale debt securities	50,463	201	12,792	276	63,255	477
Available-for-sale equity securities	—	—	—	—	—	—
Held-to-maturity debt securities						
Mortgage-backed securities:						
U.S. government agencies	4,070	38	205	2	4,275	40
Commercial	3,706	41	1,882	33	5,588	74
Total mortgage-backed securities	7,776	79	2,087	35	9,863	114
Obligations of U.S. states and municipalities	584	9	2,131	71	2,715	80
Total held-to-maturity securities	8,360	88	4,218	106	12,578	194
Total securities with gross unrealized losses	$ 58,823	$ 289	$ 17,010	$ 382	$ 75,833	$ 671

December 31, 2016 (in millions)	Securities with gross unrealized losses: Less than 12 months: Fair value	Less than 12 months: Gross unrealized losses	12 months or more: Fair value	12 months or more: Gross unrealized losses	Total fair value	Total gross unrealized losses
Available-for-sale debt securities						
Mortgage-backed securities:						
U.S. government agencies	$ 29,856	$ 463	$ 506	$ 11	$ 30,362	$ 474
Residential:						
U.S.[a]	1,373	6	1,073	22	2,446	28
Non-U.S.	–	–	886	7	886	7
Commercial	2,328	16	1,056	3	3,384	19
Total mortgage-backed securities	33,557	485	3,521	43	37,078	528
U.S. Treasury and government agencies	23,543	796	–	–	23,543	796
Obligations of U.S. states and municipalities	7,147	180	55	3	7,202	183
Certificates of deposit	–	–	–	–	–	–
Non-U.S. government debt securities	4,436	36	421	9	4,857	45
Corporate debt securities	797	2	829	20	1,626	22
Asset-backed securities:						
Collateralized loan obligations	766	2	5,263	24	6,029	26
Other	739	6	1,992	40	2,731	46
Total available-for-sale debt securities	70,985	1,507	12,081	139	83,066	1,646
Available-for-sale equity securities	–	–	–	–	–	–
Held-to-maturity debt securities						
Mortgage-backed securities:						
U.S. government agencies	3,129	37	–	–	3,129	37
Commercial	5,163	114	441	15	5,604	129
Total mortgage-backed securities	8,292	151	441	15	8,733	166
Obligations of U.S. states and municipalities	4,702	125	–	–	4,702	125
Total held-to-maturity securities	12,994	276	441	15	13,435	291
Total securities with gross unrealized losses	$ 83,979	$ 1,783	$ 12,522	$ 154	$ 96,501	$ 1,937

(a) Prior period amounts have been revised to conform with the current period presentation.

Gross unrealized losses

JPMorgan Chase Bank, N.A. has recognized unrealized losses on securities that it intends to sell as OTTI. JPMorgan Chase Bank, N.A. does not intend to sell any of the remaining securities with an unrealized loss in AOCI as of December 31, 2017, and it is not likely that JPMorgan Chase Bank, N.A. will be required to sell these securities before recovery of their amortized cost basis. Except for the securities for which credit losses have been recognized in income, JPMorgan Chase Bank, N.A. believes that the securities with an unrealized loss in AOCI are not other-than-temporarily impaired as of December 31, 2017.

Other-than-temporary impairment

AFS debt and equity securities and HTM debt securities in unrealized loss positions are analyzed as part of JPMorgan Chase Bank, N.A.'s ongoing assessment of OTTI. For most types of debt securities, JPMorgan Chase Bank, N.A. considers a decline in fair value to be other-than-temporary when JPMorgan Chase Bank, N.A. does not expect to recover the entire amortized cost basis of the security. For beneficial interests in securitizations that are rated below "AA" at their acquisition, or that can be contractually prepaid or otherwise settled in such a way that JPMorgan Chase Bank, N.A. would not recover substantially all of its recorded investment, JPMorgan Chase Bank, N.A. considers an impairment to be other-than-temporary when there is an adverse change in expected cash flows. For AFS equity securities, JPMorgan Chase Bank, N.A. considers a decline in fair value to be other-than-temporary if it is probable that JPMorgan Chase Bank, N.A. will not recover its cost basis.

Potential OTTI is considered using a variety of factors, including the length of time and extent to which the market value has been less than cost; adverse conditions specifically related to the industry, geographic area or financial condition of the issuer or underlying collateral of a security; payment structure of the security; changes to the rating of the security by a rating agency; the volatility of the fair value changes; and JPMorgan Chase Bank, N.A.'s intent and ability to hold the security until recovery.

For AFS debt securities, JPMorgan Chase Bank, N.A. recognizes OTTI losses in earnings if JPMorgan Chase Bank, N.A. has the intent to sell the debt security, or if it is more likely than not that JPMorgan Chase Bank, N.A. will be required to sell the debt security before recovery of its amortized cost basis. In these circumstances the impairment loss is equal to the full difference between the amortized cost basis and the fair value of the securities. For debt securities in an unrealized loss position that JPMorgan Chase Bank, N.A. has the intent and ability to hold, the expected cash flows to be received from the securities are evaluated to determine if a credit loss exists. In the event of a credit loss, only the amount of impairment associated with the credit loss is recognized in income. Amounts relating to factors other than credit losses are recorded in OCI.

JPMorgan Chase Bank, N.A.'s cash flow evaluations take into account the factors noted above and expectations of relevant market and economic data as of the end of the reporting period. For securities issued in a securitization, JPMorgan Chase Bank, N.A. estimates cash flows considering underlying loan-level data and structural features of the securitization, such as subordination, excess spread, overcollateralization or other forms of credit enhancement, and compares the losses projected for the underlying collateral ("pool losses") against the level of credit enhancement in the securitization structure to determine whether these features are sufficient to absorb the pool losses, or whether a credit loss exists. JPMorgan Chase Bank, N.A. also performs other analyses to support its cash flow projections, such as first-loss analyses or stress scenarios.

For equity securities, OTTI losses are recognized in earnings if JPMorgan Chase Bank, N.A.intends to sell the security. In other cases JPMorgan Chase Bank, N.A. considers the relevant factors noted above, as well as JPMorgan Chase Bank, N.A.'s intent and ability to retain its investment for a period of time sufficient to allow for any anticipated recovery in market value, and whether evidence exists to support a realizable value equal to or greater than the cost basis. Any impairment loss on an equity security is equal to the full difference between the cost basis and the fair value of the security.

Securities gains and losses

The following table presents realized gains and losses and OTTI from AFS securities that were recognized in income.

Year ended December 31, (in millions)	**2017**	2016	2015
Realized gains	**$ 1,007**	$ 388	$ 351
Realized losses	**(1,073)**	(230)	(127)
OTTI losses[(a)]	**(7)**	(28)	(22)
Net securities gains/(losses)	**$ (73)**	$ 130	$ 202
OTTI losses			
Credit losses recognized in income	**$ –**	$ (1)	$ (1)
Securities JPMorgan Chase Bank, N.A. intends to sell[(a)]	**(7)**	(27)	(21)
Total OTTI losses recognized in income	**$ (7)**	$ (28)	$ (22)

(a) Excludes realized losses on securities sold of $6 million, $24 million and $5 million for the years ended December 31, 2017, 2016 and 2015, respectively, that had been previously reported as an OTTI loss due to the intention to sell the securities.

Changes in the credit loss component of credit-impaired debt securities

The cumulative credit loss component, including any changes therein, of OTTI losses that have been recognized in income related to AFS debt securities was not material as of and during the years ended December 31, 2017, 2016 and 2015.

Contractual maturities and yields

The following table presents the amortized cost and estimated fair value at December 31, 2017, of JPMorgan Chase Bank, N.A.'s investment securities portfolio by contractual maturity.

By remaining maturity December 31, 2017 (in millions)	Due in one year or less	Due after one year through five years	Due after five years through 10 years	Due after 10 years[c]	Total
Available-for-sale debt securities					
Mortgage-backed securities[a]					
Amortized cost	$ 3	$ 698	$ 6,119	$ 78,925	$ 85,745
Fair value	3	708	6,278	79,538	86,527
Average yield[b]	4.76%	2.10%	3.09%	3.34%	3.32%
U.S. Treasury and government agencies					
Amortized cost	$ 60	$ –	$ 17,437	$ 5,013	$ 22,510
Fair value	60	–	17,542	5,143	22,745
Average yield[b]	1.72%	–%	1.96%	1.76%	1.91%
Obligations of U.S. states and municipalities					
Amortized cost	$ 73	$ 611	$ 999	$ 26,761	$ 28,444
Fair value	72	620	1,047	28,436	30,175
Average yield[b]	1.78%	2.65%	5.15%	5.44%	5.36%
Certificates of deposit					
Amortized cost	$ 59	$ –	$ –	$ –	$ 59
Fair value	59	–	–	–	59
Average yield[b]	0.50%	–%	–%	–%	0.50%
Non-U.S. government debt securities					
Amortized cost	$ 5,020	$ 13,665	$ 8,215	$ –	$ 26,900
Fair value	5,022	13,845	8,427	–	27,294
Average yield[b]	3.09%	1.55%	1.19%	–%	1.73%
Corporate debt securities					
Amortized cost	$ 150	$ 1,159	$ 1,203	$ 145	$ 2,657
Fair value	151	1,197	1,255	154	2,757
Average yield[b]	3.07%	3.60%	3.58%	3.22%	3.54%
Asset-backed securities					
Amortized cost	$ –	$ 3,372	$ 13,046	$ 13,235	$ 29,653
Fair value	–	3,353	13,080	13,336	29,769
Average yield[b]	–%	2.14%	2.58%	2.35%	2.43%
Total available-for-sale debt securities					
Amortized cost	$ 5,365	$ 19,505	$ 47,019	$ 124,079	$ 195,968
Fair value	5,367	19,723	47,629	126,607	199,326
Average yield[b]	3.03%	1.83%	2.25%	3.63%	3.10%
Available-for-sale equity securities					
Amortized cost	$ –	$ –	$ –	$ 38	$ 38
Fair value	–	–	–	38	38
Average yield[b]	–%	–%	–%	0.43%	0.43%
Total available-for-sale securities					
Amortized cost	$ 5,365	$ 19,505	$ 47,019	$ 124,117	$ 196,006
Fair value	5,367	19,723	47,629	126,645	199,364
Average yield[b]	3.03%	1.83%	2.25%	3.63%	3.10%
Held-to-maturity debt securities					
Mortgage-backed securities[a]					
Amortized Cost	$ –	$ –	$ 49	$ 33,311	$ 33,360
Fair value	–	–	49	33,756	33,805
Average yield[b]	–%	–%	2.88%	3.27%	3.27%
Obligations of U.S. states and municipalities					
Amortized cost	$ –	$ 66	$ 2,019	$ 12,288	$ 14,373
Fair value	–	65	2,067	12,715	14,847
Average yield[b]	–%	4.74%	4.30%	4.72%	4.66%
Total held-to-maturity securities					
Amortized cost	$ –	$ 66	$ 2,068	$ 45,599	$ 47,733
Fair value	–	65	2,116	46,471	48,652
Average yield[b]	–%	4.75%	4.26%	3.66%	3.69%

(a) As of December 31, 2017, mortgage-backed securities issued by Fannie Mae exceeded 10% of JPMorgan Chase Bank, N.A.'s total stockholder's equity; the amortized cost and fair value of such securities was $55.1 billion and $56.0 billion, respectively.
(b) Average yield is computed using the effective yield of each security owned at the end of the period, weighted based on the amortized cost of each security. The effective yield considers the contractual coupon, amortization of premiums and accretion of discounts, and the effect of related hedging derivatives. Taxable-equivalent amounts are used where applicable and reflect the estimated impact of the enactment of the Tax Cuts and Jobs Act ("TCJA"). The effective yield excludes unscheduled principal prepayments; and accordingly, actual maturities of securities may differ from their contractual or expected maturities as certain securities may be prepaid.
(c) Includes securities with no stated maturity. Substantially all of JPMorgan Chase Bank, N.A.'s U.S. residential MBS and collateralized mortgage obligations are due in 10 years years or more, based on contractual maturity. The estimated weighted-average life, which reflects anticipated future prepayments, is approximately six years for agency residential MBS, three years for agency residential collateralized mortgage obligations and three years for nonagency residential collateralized mortgage obligations.

Note 12 – Securities financing activities

JPMorgan Chase Bank, N.A. enters into resale agreements, repurchase agreements, securities borrowed transactions and securities loaned transactions (collectively, "securities financing agreements") primarily to finance JPMorgan Chase Bank, N.A.'s inventory positions, acquire securities to cover short positions, accommodate customers' financing needs, settle other securities obligations and to deploy JPMorgan Chase Bank, N.A.'s excess cash.

Securities financing agreements are treated as collateralized financings on JPMorgan Chase Bank, N.A.'s Consolidated balance sheets. Resale and repurchase agreements are generally carried at the amounts at which the securities will be subsequently sold or repurchased. Securities borrowed and securities loaned transactions are generally carried at the amount of cash collateral advanced or received. 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 1. Fees received and paid in connection with securities financing agreements are recorded in interest income and interest expense on the Consolidated statements of income.

JPMorgan Chase Bank, N.A. has elected the fair value option for certain securities financing agreements. For further information regarding the fair value option, see Note 4. The securities financing agreements for which the fair value option has been elected are reported within securities purchased under resale agreements, securities loaned or sold under repurchase agreements, and securities borrowed on the Consolidated balance sheets. Generally, for agreements carried at fair value, current-period interest accruals are recorded within interest income and interest expense, with changes in fair value reported in principal transactions revenue. However, for financial instruments containing embedded derivatives that would be separately accounted for in accordance with accounting guidance for hybrid instruments, all changes in fair value, including any interest elements, are reported in principal transactions revenue.

Securities financing transactions expose JPMorgan Chase Bank, N.A. primarily to credit and liquidity risk. To manage these risks, JPMorgan Chase Bank, N.A. monitors the value of the underlying securities (predominantly high-quality securities collateral, including government-issued debt and agency MBS) that it has received from or provided to its counterparties compared to the value of cash proceeds 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, JPMorgan Chase Bank, N.A. 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, JPMorgan Chase Bank, N.A. 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 JPMorgan Chase Bank, N.A.'s policy to take possession, where possible, of the securities underlying resale agreements and securities borrowed transactions. For further information regarding assets pledged and collateral received in securities financing agreements, see Note 26.

As a result of JPMorgan Chase Bank, N.A.'s credit risk mitigation practices with respect to resale and securities borrowed agreements as described above, JPMorgan Chase Bank, N.A. did not hold any reserves for credit impairment with respect to these agreements as of December 31, 2017 and 2016.

The table below summarizes the gross and net amounts of JPMorgan Chase Bank, N.A.'s securities financing agreements, as of December 31, 2017, and 2016. When JPMorgan Chase Bank, N.A. 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, JPMorgan Chase Bank, N.A. nets, on the Consolidated balance sheets, the balances outstanding under its securities financing agreements with the same counterparty. In addition, JPMorgan Chase Bank, N.A. exchanges securities and/or cash collateral with its counterparties; this collateral also reduces the economic exposure with the counterparty. Such collateral, along with securities financing balances that do not meet all these relevant netting criteria under U.S. GAAP, is presented as "Amounts not nettable on the Consolidated balance sheets," and reduces the "Net amounts" presented below, if JPMorgan Chase Bank, N.A. 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" below, and related collateral does not reduce the amounts presented.

	2017				
December 31, (in millions)	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets[b]	Amounts not nettable on the Consolidated balance sheets[c]	Net amounts[d]
Assets					
Securities purchased under resale agreements	**$ 346,606**	**$ (191,712)**	**$ 154,894**	**$ (146,035)**	**$ 8,859**
Securities borrowed	**40,349**	**(1,340)**	**39,009**	**(36,386)**	**2,623**
Liabilities					
Securities sold under repurchase agreements	**$ 275,452**	**$ (191,712)**	**$ 83,740**	**$ (80,769)**	**$ 2,971**
Securities loaned and other[a]	**17,534**	**(1,340)**	**16,194**	**(16,017)**	**177**

	2016				
December 31, (in millions)	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets[b]	Amounts not nettable on the Consolidated balance sheets[c]	Net amounts[d]
Assets					
Securities purchased under resale agreements	$ 320,678	$ (148,236)	$ 172,442	$ (165,651)	$ 6,791
Securities borrowed	32,497	–	32,497	(30,175)	2,322
Liabilities					
Securities sold under repurchase agreements	$ 214,823	$ (148,236)	$ 66,587	$ (64,082)	$ 2,505
Securities loaned and other[a]	14,996	–	14,996	(14,093)	903

(a) Includes securities-for-securities lending transactions of $7.5 billion at both December 31, 2017 and 2016, accounted for at fair value, where JPMorgan Chase Bank, N.A. is acting as lender. These amounts are presented within accounts payable and other liabilities in the Consolidated balance sheets.
(b) Includes securities financing agreements accounted for at fair value. At December 31, 2017 and 2016, included securities purchased under resale agreements of $2.9 billion and $5.3 billion, respectively, and securities sold under agreements to repurchase of $3.4 billion and $399 million, respectively. There were $3.0 billion of securities borrowed at December 31, 2017, and there were no securities borrowed at December 31, 2016. There were no securities loaned accounted for at fair value in either period.
(c) 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.
(d) 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, 2017 and 2016, included $6.9 billion and $4.5 billion, respectively, of securities purchased under resale agreements; $1.6 billion and $1.9 billion, respectively, of securities borrowed; $441 million and $523 million, respectively, of securities sold under agreements to repurchase; and $2 million and $11 million, respectively, of securities loaned and other.

The tables below present as of December 31, 2017, and 2016 the types of financial assets pledged in securities financing agreements and the remaining contractual maturity of the securities financing agreements.

	Gross liability balance			
	2017		2016	
December 31, (in millions)	Securities sold under repurchase agreements	Securities loaned and other[b]	Securities sold under repurchase agreements	Securities loaned and other[b]
Mortgage-backed securities:				
U.S. government agencies[a]	**$ 3,046**	**$ –**	$ 783	$ –
Residential - nonagency	**832**	**–**	2,076	–
Commercial - nonagency	**46**	**–**	139	–
U.S. Treasury and government agencies[a]	**88,982**	**7,010**	52,023	7,036
Non-U.S. government debt	**172,197**	**2,585**	150,599	1,617
Corporate debt securities	**9,910**	**411**	8,097	465
Asset-backed securities	**439**	**1**	1,106	–
Equity securities	**–**	**7,527**	–	5,878
Total	**$ 275,452**	**$ 17,534**	$ 214,823	$ 14,996

	Remaining contractual maturity of the agreements				
2017 (in millions)	Overnight and continuous	Up to 30 days	30 – 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	**$ 65,759**	**$ 145,226**	**$ 43,892**	**$ 20,575**	**$ 275,452**
Total securities loaned and other[b]	**15,683**	**166**	**–**	**1,685**	**17,534**

	Remaining contractual maturity of the agreements				
2016 (in millions)	Overnight and continuous	Up to 30 days	30 – 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	$ 31,776	$ 122,979	$ 39,398	$ 20,670	$ 214,823
Total securities loaned and other[b]	12,880	1,388	520	208	14,996

(a) Prior period amounts were revised to conform with the current period presentation.
(b) Includes securities-for-securities lending transactions of $7.5 billion at both December 31, 2017 and 2016, accounted for at fair value, where JPMorgan Chase Bank, N.A. is acting as lender. These amounts are presented within accounts payable and other liabilities on the Consolidated balance sheets.

Transfers not qualifying for sale accounting

At December 31, 2017 and 2016, JPMorgan Chase Bank, N.A. held $1.5 billion and $5.8 billion, respectively, of financial assets for which the rights have been transferred to third parties; however, the transfers did not qualify as a sale in accordance with U.S. GAAP. These transfers have been recognized as collateralized financing transactions. The transferred assets are recorded in trading assets and loans, and the corresponding liabilities are recorded predominantly in short-term borrowings on the Consolidated balance sheets.

Note 13 – Loans

Loan accounting framework

The accounting for a loan depends on management's strategy for the loan, and on whether the loan was credit-impaired at the date of acquisition. JPMorgan Chase Bank, N.A. accounts for loans based on the following categories:

- Originated or purchased loans held-for-investment (i.e., "retained"), other than PCI loans
- Loans held-for-sale
- Loans at fair value
- PCI loans held-for-investment

The following provides a detailed accounting discussion of these loan categories:

Loans held-for-investment (other than PCI loans)
Originated or purchased loans held-for-investment, other than PCI loans, are recorded at the principal amount outstanding, net of the following: charge-offs; interest applied to principal (for loans accounted for on the cost recovery method); unamortized discounts and premiums; and net deferred loan fees or costs. Credit card loans also include billed finance charges and fees net of an allowance for uncollectible amounts.

Interest income
Interest income on performing loans held-for-investment, other than PCI loans, is accrued and recognized as interest income at the contractual rate of interest. Purchase price discounts or premiums, as well as net deferred loan fees or costs, are amortized into interest income over the contractual life of the loan to produce a level rate of return.

Nonaccrual loans
Nonaccrual loans are those on which the accrual of interest has been suspended. Loans (other than credit card loans and certain consumer loans insured by U.S. government agencies) are placed on nonaccrual status and considered nonperforming when full payment of principal and interest is not expected, regardless of delinquency status, or when principal and interest has been in default for a period of 90 days or more, unless the loan is both well-secured and in the process of collection. A loan is determined to be past due when the minimum payment is not received from the borrower by the contractually specified due date or for certain loans (e.g., residential real estate loans), when a monthly payment is due and unpaid for 30 days or more. Finally, collateral-dependent loans are typically maintained on nonaccrual status.

On the date a loan is placed on nonaccrual status, all interest accrued but not collected is reversed against interest income. In addition, the amortization of deferred amounts is suspended. Interest income on nonaccrual loans may be recognized as cash interest payments are received (i.e., on a cash basis) if the recorded loan balance is deemed fully collectible; however, if there is doubt regarding the ultimate collectibility of the recorded loan balance, all interest cash receipts are applied to reduce the carrying value of the loan (the cost recovery method). For consumer loans, application of this policy typically results in JPMorgan Chase Bank, N.A. recognizing interest income on nonaccrual consumer loans on a cash basis.

A loan may be returned to accrual status when repayment is reasonably assured and there has been demonstrated performance under the terms of the loan or, if applicable, the terms of the restructured loan.

As permitted by regulatory guidance, credit card loans are generally exempt from being placed on nonaccrual status; accordingly, interest and fees related to credit card loans continue to accrue until the loan is charged off or paid in full. However, JPMorgan Chase Bank, N.A. separately establishes an allowance, which is offset against loans and charged to interest income, for the estimated uncollectible portion of accrued and billed interest and fee income on credit card loans. The allowance is established with a charge to interest income and is reported as an offset to loans.

Allowance for loan losses
The allowance for loan losses represents the estimated probable credit losses inherent in the held-for-investment loan portfolio at the balance sheet date and is recognized on the balance sheet as a contra asset, which brings the recorded investment to the net carrying value. Changes in the allowance for loan losses are recorded in the provision for credit losses on JPMorgan Chase Bank, N.A.'s Consolidated statements of income. See Note 14 for further information on JPMorgan Chase Bank, N.A.'s accounting policies for the allowance for loan losses.

Charge-offs
Consumer loans, other than risk-rated business banking and auto loans, and PCI loans, are generally charged off or charged down to the net realizable value of the underlying collateral (i.e., fair value less costs to sell), with an offset to the allowance for loan losses, upon reaching specified stages of delinquency in accordance with standards established by the Federal Financial Institutions Examination Council ("FFIEC"). Residential real estate loans and non-modified credit card loans are generally charged off no later than 180 days past due. Scored auto, student and modified credit card loans are charged off no later than 120 days past due.

Certain consumer loans will be charged off or charged down to their net realizable value earlier than the FFIEC charge-off standards in certain circumstances as follows:

- Loans modified in a troubled debt restructuring ("TDR") that are determined to be collateral-dependent.
- Loans to borrowers who have experienced an event that suggests a loss is either known or highly certain are subject to accelerated charge-off standards (e.g., residential real estate and auto loans are charged off

within 60 days of receiving notification of a bankruptcy filing).

- Auto loans upon repossession of the automobile.

Other than in certain limited circumstances, JPMorgan Chase Bank, N.A. typically does not recognize charge-offs on government-guaranteed loans.

Wholesale loans, risk-rated business banking loans and risk-rated auto loans are charged off when it is highly certain that a loss has been realized, including situations where a loan is determined to be both impaired and collateral-dependent. The determination of whether to recognize a charge-off includes many factors, including the prioritization of JPMorgan Chase Bank, N.A.'s claim in bankruptcy, expectations of the workout/restructuring of the loan and valuation of the borrower's equity or the loan collateral.

When a loan is charged down to the estimated net realizable value, the determination of the fair value of the collateral depends on the type of collateral (e.g., securities, real estate). In cases where the collateral is in the form of liquid securities, the fair value is based on quoted market prices or broker quotes. For illiquid securities or other financial assets, the fair value of the collateral is estimated using a discounted cash flow model.

For residential real estate loans, collateral values are based upon external valuation sources. When it becomes likely that a borrower is either unable or unwilling to pay, JPMorgan Chase Bank, N.A. obtains a broker's price opinion of the home based on an exterior-only valuation ("exterior opinions"), which is then updated at least every six months thereafter. As soon as practicable after JPMorgan Chase Bank, N.A. receives the property in satisfaction of a debt (e.g., by taking legal title or physical possession), JPMorgan Chase Bank, N.A. generally obtains an appraisal based on an inspection that includes the interior of the home ("interior appraisals"). Exterior opinions and interior appraisals are discounted based upon JPMorgan Chase Bank, N.A.'s experience with actual liquidation values as compared with the estimated values provided by exterior opinions and interior appraisals, considering state-specific factors.

For commercial real estate loans, collateral values are generally based on appraisals from internal and external valuation sources. Collateral values are typically updated every six to twelve months, either by obtaining a new appraisal or by performing an internal analysis, in accordance with JPMorgan Chase Bank, N.A.'s policies. JPMorgan Chase Bank, N.A. also considers both borrower- and market-specific factors, which may result in obtaining appraisal updates or broker price opinions at more frequent intervals.

Loans held-for-sale

Held-for-sale loans are measured at the lower of cost or fair value, with valuation changes recorded in noninterest revenue. For consumer loans, the valuation is performed on a portfolio basis. For wholesale loans, the valuation is performed on an individual loan basis.

Interest income on loans held-for-sale is accrued and recognized based on the contractual rate of interest.

Loan origination fees or costs and purchase price discounts or premiums are deferred in a contra loan account until the related loan is sold. The deferred fees or costs and discounts or premiums are an adjustment to the basis of the loan and therefore are included in the periodic determination of the lower of cost or fair value adjustments and/or the gain or loss recognized at the time of sale.

Held-for-sale loans are subject to the nonaccrual policies described above.

Because held-for-sale loans are recognized at the lower of cost or fair value, JPMorgan Chase Bank, N.A.'s allowance for loan losses and charge-off policies do not apply to these loans.

Loans at fair value

Loans used in a market-making strategy or risk managed on a fair value basis are measured at fair value, with changes in fair value recorded in noninterest revenue.

Interest income on these loans is accrued and recognized based on the contractual rate of interest. Changes in fair value are recognized in noninterest revenue. Loan origination fees are recognized upfront in noninterest revenue. Loan origination costs are recognized in the associated expense category as incurred.

Because these loans are recognized at fair value, JPMorgan Chase Bank, N.A.'s allowance for loan losses and charge-off policies do not apply to these loans.

See Note 4 for further information on JPMorgan Chase Bank, N.A.'s elections of fair value accounting under the fair value option. See Note 3 and Note 4 for further information on loans carried at fair value and classified as trading assets.

PCI loans

PCI loans held-for-investment are initially measured at fair value. PCI loans have evidence of credit deterioration since the loan's origination date and therefore it is probable, at acquisition, that all contractually required payments will not be collected. Because PCI loans are initially measured at fair value, which includes an estimate of future credit losses, no allowance for loan losses related to PCI loans is recorded at the acquisition date. See page 87 of this Note for information on accounting for PCI loans subsequent to their acquisition.

Loan classification changes

Loans in the held-for-investment portfolio that management decides to sell are transferred to the held-for-sale portfolio at the lower of cost or fair value on the date of transfer. Credit-related losses are charged against the allowance for loan losses; non-credit related losses such as those due to changes in interest rates or foreign currency exchange rates are recognized in noninterest revenue.

In the event that management decides to retain a loan in the held-for-sale portfolio, the loan is transferred to the held-for-investment portfolio at the lower of cost or fair value on the date of transfer. These loans are subsequently assessed for impairment based on JPMorgan Chase Bank, N.A.'s allowance methodology. For a further discussion of the methodologies used in establishing JPMorgan Chase Bank, N.A.'s allowance for loan losses, see Note 14.

Loan modifications

JPMorgan Chase Bank, N.A. seeks to modify certain loans in conjunction with its loss-mitigation activities. Through the modification, JPMorgan Chase Bank, N.A. grants one or more concessions to a borrower who is experiencing financial difficulty in order to minimize JPMorgan Chase Bank, N.A.'s economic loss and avoid foreclosure or repossession of the collateral, and to ultimately maximize payments received by JPMorgan Chase Bank, N.A. from the borrower. The concessions granted vary by program and by borrower-specific characteristics, and may include interest rate reductions, term extensions, payment deferrals, principal forgiveness, or the acceptance of equity or other assets in lieu of payments.

Such modifications are accounted for and reported as TDRs. A loan that has been modified in a TDR is generally considered to be impaired until it matures, is repaid, or is otherwise liquidated, regardless of whether the borrower performs under the modified terms. In certain limited cases, the effective interest rate applicable to the modified loan is at or above the current market rate at the time of the restructuring. In such circumstances, and assuming that the loan subsequently performs under its modified terms and JPMorgan Chase Bank, N.A. expects to collect all contractual principal and interest cash flows, the loan is disclosed as impaired and as a TDR only during the year of the modification; in subsequent years, the loan is not disclosed as an impaired loan or as a TDR so long as repayment of the restructured loan under its modified terms is reasonably assured.

Loans, except for credit card loans, modified in a TDR are generally placed on nonaccrual status, although in many cases such loans were already on nonaccrual status prior to modification. These loans may be returned to performing status (the accrual of interest is resumed) if the following criteria are met: (i) the borrower has performed under the modified terms for a minimum of six months and/or six payments, and (ii) JPMorgan Chase Bank, N.A. has an expectation that repayment of the modified loan is reasonably assured based on, for example, the borrower's debt capacity and level of future earnings, collateral values, LTV ratios, and other current market considerations. In certain limited and well-defined circumstances in which the loan is current at the modification date, such loans are not placed on nonaccrual status at the time of modification.

Because loans modified in TDRs are considered to be impaired, these loans are measured for impairment using JPMorgan Chase Bank, N.A.'s established asset-specific allowance methodology, which considers the expected re-default rates for the modified loans. A loan modified in a TDR generally remains subject to the asset-specific allowance methodology throughout its remaining life, regardless of whether the loan is performing and has been returned to accrual status and/or the loan has been removed from the impaired loans disclosures (i.e., loans restructured at market rates). For further discussion of the methodology used to estimate JPMorgan Chase Bank, N.A.'s asset-specific allowance, see Note 14.

Foreclosed property

JPMorgan Chase Bank, N.A. acquires property from borrowers through loan restructurings, workouts, and foreclosures. Property acquired may include real property (e.g., residential real estate, land, and buildings) and commercial and personal property (e.g., automobiles, aircraft, railcars, and ships).

JPMorgan Chase Bank, N.A. recognizes foreclosed property upon receiving assets in satisfaction of a loan (e.g., by taking legal title or physical possession). For loans collateralized by real property, JPMorgan Chase Bank, N.A. generally recognizes the asset received at foreclosure sale or upon the execution of a deed in lieu of foreclosure transaction with the borrower. Foreclosed assets are reported in other assets on the Consolidated balance sheets and initially recognized at fair value less costs to sell. Each quarter the fair value of the acquired property is reviewed and adjusted, if necessary, to the lower of cost or fair value. Subsequent adjustments to fair value are charged/credited to noninterest revenue. Operating expense, such as real estate taxes and maintenance, are charged to other expense.

Loan portfolio

JPMorgan Chase Bank, N.A.'s loan portfolio is divided into three portfolio segments, which are the same segments used by JPMorgan Chase Bank, N.A. to determine the allowance for loan losses: Consumer, excluding credit card; Credit card; and Wholesale. Within each portfolio segment JPMorgan Chase Bank, N.A. monitors and assesses the credit risk in the following classes of loans, based on the risk characteristics of each loan class.

Consumer, excluding credit card[a]	Credit card	Wholesale[g]
Residential real estate – excluding PCI • Residential mortgage[b] • Home equity[c] Other consumer loans • Auto[d] • Consumer & business banking[d][e] • Student Residential real estate – PCI • Home equity • Prime mortgage • Subprime mortgage • Option ARMs	• Credit card loans[f]	• Commercial and industrial • Real estate • Financial institutions • Government agencies • Other[h]

(a) Includes loans held in the consumer & community banking business, prime mortgage and home equity loans held in the asset & wealth management business and prime mortgage loans held in the corporate function.
(b) Predominantly includes prime (including option ARMs) and subprime loans.
(c) Includes senior and junior lien home equity loans.
(d) Includes certain business banking and auto dealer risk-rated loans that apply the wholesale methodology for determining the allowance for loan losses; these loans are managed by the consumer & community banking business, and therefore, for consistency in presentation, are included with the other consumer loan classes.
(e) Predominantly includes business banking loans.
(f) Predominantly includes credit card loans acquired pursuant to a participation agreement with Chase Bank USA, N.A., a related-party, and subsequent draws on revolving credit lines associated with the participation agreement.
(g) Includes loans held in the corporate & investment banking, commercial banking and asset & wealth management businesses and in the corporate function. Excludes prime mortgage and home equity loans held in the asset & wealth management businesses and prime mortgage loans held in the corporate function. Classes are internally defined and may not align with regulatory definitions.
(h) Includes loans to: individuals; SPEs; and private education and civic organizations. For more information on SPEs, see Note 15.

The following tables summarize JPMorgan Chase Bank, N.A.'s loan balances by portfolio segment.

December 31, 2017 (in millions)	Consumer, excluding credit card	Credit card[a]	Wholesale	Total
Retained	**$ 372,517**	**$ 40,911**	**$ 406,926**	**$ 820,354**[b]
Held-for-sale	**128**	**124**	**3,099**	**3,351**
At fair value	**—**	**—**	**2,508**	**2,508**
Total	**$ 372,645**	**$ 41,035**	**$ 412,533**	**$ 826,213**

December 31, 2016 (in millions)	Consumer, excluding credit card	Credit card[a]	Wholesale	Total
Retained	$ 364,360	$ 35,773	$ 387,132	$ 787,265[b]
Held-for-sale	238	105	2,283	2,626
At fair value	—	—	2,228	2,228
Total	$ 364,598	$ 35,878	$ 391,643	$ 792,119

(a) Includes accrued interest and fees net of an allowance for the uncollectible portion of accrued interest and fee income.
(b) Loans (other than PCI loans and those for which the fair value option has been elected) are presented net of unamortized discounts and premiums and net deferred loan fees or costs. These amounts were not material as of December 31, 2017 and 2016.

The following table provides information about the carrying value of retained loans purchased, sold and reclassified to held-for-sale during the periods indicated. This table excludes loans recorded at fair value. JPMorgan Chase Bank, N.A. manages its exposure to credit risk on an ongoing basis. Selling loans is one way that JPMorgan Chase Bank, N.A. reduces its credit exposures.

Year ended December 31, (in millions)	**2017**			
	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	**$ 3,461** [a][b]	**$ –**	**$ 1,799**	**$ 5,260**
Sales	**3,405**	**–**	**11,063**	**14,468**
Retained loans reclassified to held-for-sale	**6,340** [c]	**–**	**1,229**	**7,569**

Year ended December 31, (in millions)	2016			
	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	$ 4,116 [a][b]	$ –	$ 1,448	$ 5,564
Sales	6,368	–	8,739	15,107
Retained loans reclassified to held-for-sale	321	–	2,381	2,702

Year ended December 31, (in millions)	2015			
	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	$ 5,279 [a][b]	$ –	$ 1,066	$ 6,345
Sales	5,049	–	9,195	14,244
Retained loans reclassified to held-for-sale	1,439	79	642	2,160

(a) Purchases predominantly represent JPMorgan Chase Bank, N.A.'s voluntary repurchase of certain delinquent loans from loan pools as permitted by Government National Mortgage Association ("Ginnie Mae") guidelines. JPMorgan Chase Bank, N.A. typically elects to repurchase these delinquent loans as it continues to service them and/or manage the foreclosure process in accordance with applicable requirements of Ginnie Mae, the Federal Housing Administration ("FHA"), Rural Housing Service ("RHS") and/or the U.S. Department of Veterans Affairs ("VA").
(b) Excludes purchases of retained loans sourced through the correspondent origination channel and underwritten in accordance with JPMorgan Chase Bank, N.A.'s standards. Such purchases were $23.5 billion, $30.4 billion and $50.3 billion for the years ended December 31, 2017, 2016 and 2015, respectively.
(c) Includes the JPMorgan Chase Bank, N.A.'s student loan portfolio which was sold in 2017.

The following table provides information about gains and losses on loan sales, including lower of cost or fair value adjustments, on loan sales by portfolio segment.

Year ended December 31, (in millions)	**2017**	2016	2015
Net gains/(losses) on sales of loans (including lower of cost or fair value adjustments)[a]			
Consumer, excluding credit card[b]	**$ (126)**	$ 231	$ 305
Credit card	**(8)**	(12)	(3)
Wholesale	**38**	26	15
Total net gains/(losses) on sales of loans (including lower of cost or fair value adjustments)	**$ (96)**	$ 245	$ 317

(a) Excludes sales related to loans accounted for at fair value.
(b) Includes amounts related to JPMorgan Chase Bank, N.A.'s student loan portfolio which was sold in 2017.

Consumer, excluding credit card, loan portfolio

Consumer loans, excluding credit card loans, consist primarily of residential mortgages, home equity loans and lines of credit, auto loans, consumer and business banking loans and student loans, with a focus on serving the prime consumer credit market. The portfolio also includes home equity loans secured by junior liens, prime mortgage loans with an interest-only payment period, and certain payment-option loans that may result in negative amortization.

The table below provides information about retained consumer loans, excluding credit card, by class. In 2017, JPMorgan Chase Bank, N.A sold its student loan portfolio.

December 31, (in millions)	2017	2016
Residential real estate – excluding PCI		
Residential mortgage[(a)]	**$ 216,468**	$ 192,455
Home equity	**33,442**	39,049
Other consumer loans		
Auto	**66,242**	65,814
Consumer & business banking[(a)]	**25,789**	24,306
Student[(a)]	**—**	7,057
Residential real estate – PCI		
Home equity	**10,799**	12,902
Prime mortgage	**6,479**	7,602
Subprime mortgage	**2,609**	2,941
Option ARMs	**10,689**	12,234
Total retained loans	**$ 372,517**	$ 364,360

(a) Certain loan portfolios have been reclassified. The prior period amounts have been revised to conform with the current period presentation.

Delinquency rates are a primary credit quality indicator for consumer loans. Loans that are more than 30 days past due provide an early warning of borrowers who may be experiencing financial difficulties and/or who may be unable or unwilling to repay the loan. As the loan continues to age, it becomes more clear whether the borrower is likely either unable or unwilling to pay. In the case of residential real estate loans, late-stage delinquencies (greater than 150 days past due) are a strong indicator of loans that will ultimately result in a foreclosure or similar liquidation transaction. In addition to delinquency rates, other credit quality indicators for consumer loans vary based on the class of loan, as follows:

For residential real estate loans, including both non-PCI and PCI portfolios, the current estimated LTV ratio, or the combined LTV ratio in the case of junior lien loans, is an indicator of the potential loss severity in the event of default. Additionally, LTV or combined LTV ratios can provide insight into a borrower's continued willingness to pay, as the delinquency rate of high-LTV loans tends to be greater than that for loans where the borrower has equity in the collateral. The geographic distribution of the loan collateral also provides insight as to the credit quality of the portfolio, as factors such as the regional economy, home price changes and specific events such as natural disasters, will affect credit quality. The borrower's current or "refreshed" FICO score is a secondary credit-quality indicator for certain loans, as FICO scores are an indication of the borrower's credit payment history. Thus, a loan to a borrower with a low FICO score (less than 660) is considered to be of higher risk than a loan to a borrower with a higher FICO score. Further, a loan to a borrower with a high LTV ratio and a low FICO score is at greater risk of default than a loan to a borrower that has both a high LTV ratio and a high FICO score.

- For scored auto and scored business banking loans, geographic distribution is an indicator of the credit performance of the portfolio. Similar to residential real estate loans, geographic distribution provides insights into the portfolio performance based on regional economic activity and events.
- Risk-rated business banking and auto loans are similar to wholesale loans in that the primary credit quality indicators are the risk rating that is assigned to the loan and whether the loans are considered to be criticized and/or nonaccrual. Risk ratings are reviewed on a regular and ongoing basis by Credit Risk Management and are adjusted as necessary for updated information about borrowers' ability to fulfill their obligations. For further information about risk-rated wholesale loan credit quality indicators, see page 92 of this Note.

Residential real estate — excluding PCI loans

The following table provides information by class for residential real estate — excluding retained PCI loans.

Residential real estate – excluding PCI loans

December 31, (in millions, except ratios)	Residential mortgage[g]		Home equity		Total residential real estate – excluding PCI	
	2017	2016	**2017**	2016	**2017**	2016
Loan delinquency[a]						
Current	**$ 208,692**	$ 184,109	**$ 32,383**	$ 37,927	**$ 241,075**	$ 222,036
30–149 days past due	**4,230**	3,824	**671**	646	**4,901**	4,470
150 or more days past due	**3,546**	4,522	**388**	476	**3,934**	4,998
Total retained loans	**$ 216,468**	$ 192,455	**$ 33,442**	$ 39,049	**$ 249,910**	$ 231,504
% of 30+ days past due to total retained loans[b]	**0.77%**	0.75%	**3.17%**	2.87%	**1.09%**	1.11%
90 or more days past due and government guaranteed[c]	**$ 4,170**	$ 4,856	**$ —**	$ —	**$ 4,170**	$ 4,856
Nonaccrual loans	**2,172**	2,253	**1,610**	1,844	**3,782**	4,097
Current estimated LTV ratios[d][e]						
Greater than 125% and refreshed FICO scores:						
Equal to or greater than 660	**$ 37**	$ 30	**$ 10**	$ 70	**$ 47**	$ 100
Less than 660	**19**	48	**3**	15	**22**	63
101% to 125% and refreshed FICO scores:						
Equal to or greater than 660	**36**	135	**296**	668	**332**	803
Less than 660	**88**	177	**95**	220	**183**	397
80% to 100% and refreshed FICO scores:						
Equal to or greater than 660	**4,369**	4,025	**1,675**	2,960	**6,044**	6,985
Less than 660	**483**	717	**569**	945	**1,052**	1,662
Less than 80% and refreshed FICO scores:						
Equal to or greater than 660	**194,752**	169,570	**25,255**	27,307	**220,007**	196,877
Less than 660	**6,945**	6,753	**3,850**	4,380	**10,795**	11,133
No FICO/LTV available	**1,257**	1,649	**1,689**	2,484	**2,946**	4,133
U.S. government-guaranteed	**8,482**	9,351	**—**	—	**8,482**	9,351
Total retained loans	**$ 216,468**	$ 192,455	**$ 33,442**	$ 39,049	**$ 249,910**	$ 231,504
Geographic region						
California	**$ 68,855**	$ 59,802	**$ 6,580**	$ 7,641	**$ 75,435**	$ 67,443
New York	**27,470**	24,912	**6,864**	7,975	**34,334**	32,887
Illinois	**14,501**	13,125	**2,520**	2,946	**17,021**	16,071
Texas	**12,507**	10,771	**2,021**	2,224	**14,528**	12,995
Florida	**9,596**	8,393	**1,847**	2,132	**11,443**	10,525
New Jersey	**7,142**	6,374	**1,957**	2,252	**9,099**	8,626
Washington	**6,962**	5,450	**1,026**	1,228	**7,988**	6,678
Colorado	**7,335**	6,306	**631**	677	**7,966**	6,983
Massachusetts	**6,323**	5,834	**295**	371	**6,618**	6,205
Arizona	**4,109**	3,595	**1,438**	1,771	**5,547**	5,366
All other[f]	**51,668**	47,893	**8,263**	9,832	**59,931**	57,725
Total retained loans	**$ 216,468**	$ 192,455	**$ 33,442**	$ 39,049	**$ 249,910**	$ 231,504

(a) Individual delinquency classifications include mortgage loans insured by U.S. government agencies as follows: current included $2.4 billion and $2.5 billion; 30–149 days past due included $3.2 billion and $3.1 billion; and 150 or more days past due included $2.9 billion and $3.8 billion at December 31, 2017 and 2016, respectively.
(b) At December 31, 2017 and 2016, residential mortgage loans excluded mortgage loans insured by U.S. government agencies of $6.1 billion and $6.9 billion, respectively, that are 30 or more days past due. These amounts have been excluded based upon the government guarantee.
(c) These balances, which are 90 days or more past due, were excluded from nonaccrual loans as the loans are guaranteed by U.S. government agencies. Typically, the principal balance of the loans is insured and interest is guaranteed at a specified reimbursement rate subject to meeting agreed-upon servicing guidelines. At December 31, 2017, and 2016, these balances included $1.5 billion and $2.2 billion, respectively, of loans that are no longer accruing interest based on the agreed-upon servicing guidelines. For the remaining balance, interest is being accrued at the guaranteed reimbursement rate. There were no loans that were not guaranteed by U.S. government agencies that are 90 or more days past due and still accruing interest at December 31, 2017, and 2016.
(d) Represents the aggregate unpaid principal balance of loans divided by the estimated current property value. Current property values are estimated, at a minimum, quarterly, based on home valuation models using nationally recognized home price index valuation estimates incorporating actual data to the extent available and forecasted data where actual data is not available. These property values do not represent actual appraised loan level collateral values; as such, the resulting ratios are necessarily imprecise and should be viewed as estimates. Current estimated combined LTV for junior lien home equity loans considers all available lien positions, as well as unused lines, related to the property.
(e) Refreshed FICO scores represent each borrower's most recent credit score, which is obtained by JPMorgan Chase Bank, N.A. on at least a quarterly basis.
(f) At December 31, 2017 and 2016, included mortgage loans insured by U.S. government agencies of $8.5 billion and $9.4 billion, respectively.
(g) Certain loan portfolios have been reclassified. The prior period amounts have been revised to conform with the current period presentation.

The following table represents JPMorgan Chase Bank, N.A.'s delinquency statistics for junior lien home equity loans and lines as of December 31, 2017 and 2016.

	Total loans		Total 30+ day delinquency rate	
December 31, (in millions, except ratios)	**2017**	2016	**2017**	2016
HELOCs:[a]				
Within the revolving period[b]	**$ 6,360**	$ 10,297	**0.50%**	1.27%
Beyond the revolving period	**13,527**	13,265	**3.56**	3.05
HELOANs	**1,371**	1,861	**3.50**	2.85
Total	**$ 21,258**	$ 25,423	**2.64%**	2.32%

(a) These HELOCs are predominantly revolving loans for a 10-year period, after which time the HELOC converts to a loan with a 20-year amortization period, but also include HELOCs that allow interest-only payments beyond the revolving period.
(b) JPMorgan Chase Bank, N.A. manages the risk of HELOCs during their revolving period by closing or reducing the undrawn line to the extent permitted by law when borrowers are experiencing financial difficulty.

HELOCs beyond the revolving period and HELOANs have higher delinquency rates than HELOCs within the revolving period. That is primarily because the fully-amortizing payment that is generally required for those products is higher than the minimum payment options available for HELOCs within the revolving period. The higher delinquency rates associated with amortizing HELOCs and HELOANs are factored into JPMorgan Chase Bank, N.A.'s allowance for loan losses.

Impaired loans

The table below sets forth information about JPMorgan Chase Bank, N.A.'s residential real estate impaired loans, excluding PCI loans. These loans are considered to be impaired as they have been modified in a TDR. All impaired loans are evaluated for an asset-specific allowance as described in Note 14.

	Residential mortgage		Home equity		Total residential real estate – excluding PCI	
December 31, (in millions)	**2017**	2016	**2017**	2016	**2017**	2016
Impaired loans						
With an allowance	**$ 4,402**	$ 4,681	**$ 1,236**	$ 1,266	**$ 5,638**	$ 5,947
Without an allowance[a]	**1,211**	1,341	**882**	998	**2,093**	2,339
Total impaired loans[b][c]	**$ 5,613**	$ 6,022	**$ 2,118**	$ 2,264	**$ 7,731**	$ 8,286
Allowance for loan losses related to impaired loans	**$ 62**	$ 68	**$ 111**	$ 121	**$ 173**	$ 189
Unpaid principal balance of impaired loans[d]	**7,732**	8,274	**3,701**	3,846	**11,433**	12,120
Impaired loans on nonaccrual status[e]	**1,741**	1,752	**1,031**	1,116	**2,772**	2,868

(a) Represents collateral-dependent residential real estate loans that are charged off to the fair value of the underlying collateral less costs to sell. JPMorgan Chase Bank, N.A. reports, in accordance with regulatory guidance, residential real estate loans that have been discharged under Chapter 7 bankruptcy and not reaffirmed by the borrower ("Chapter 7 loans") as collateral-dependent nonaccrual TDRs, regardless of their delinquency status. At December 31, 2017, Chapter 7 residential real estate loans included approximately 12% of home equity and 15% of residential mortgages that were 30 days or more past due.
(b) At December 31, 2017 and 2016, $3.8 billion and $3.4 billion, respectively, of loans modified subsequent to repurchase from Ginnie Mae in accordance with the standards of the appropriate government agency (i.e., FHA, VA, RHS) are not included in the table above. When such loans perform subsequent to modification in accordance with Ginnie Mae guidelines, they are generally sold back into Ginnie Mae loan pools. Modified loans that do not re-perform become subject to foreclosure.
(c) Predominantly all residential real estate impaired loans, excluding PCI loans, are in the U.S.
(d) Represents the contractual amount of principal owed at December 31, 2017 and 2016. The unpaid principal balance differs from the impaired loan balances due to various factors including charge-offs, net deferred loan fees or costs, and unamortized discounts or premiums on purchased loans.
(e) As of December 31, 2017 and 2016, nonaccrual loans included $2.2 billion and $2.3 billion, respectively, of TDRs for which the borrowers were less than 90 days past due. For additional information about loans modified in a TDR that are on nonaccrual status refer to the Loan accounting framework on pages 75–77 of this Note.

The following table presents average impaired loans and the related interest income reported by JPMorgan Chase Bank, N.A.

Year ended December 31,	Average impaired loans			Interest income on impaired loans[(a)]			Interest income on impaired loans on a cash basis[(a)]		
(in millions)	**2017**	2016	2015	**2017**	2016	2015	**2017**	2016	2015
Residential mortgage	**$ 5,789**	$ 6,365	$ 7,092	**$ 287**	$ 305	$ 325	**$ 75**	$ 77	$ 84
Home equity	**2,189**	2,311	2,340	**127**	124	128	**80**	80	84
Total residential real estate – excluding PCI	**$ 7,978**	$ 8,676	$ 9,432	**$ 414**	$ 429	$ 453	**$ 155**	$ 157	$ 168

(a) Generally, interest income on loans modified in TDRs is recognized on a cash basis until such time as the borrower has made a minimum of six payments under the new terms, unless the loan is deemed to be collateral-dependent.

Loan modifications

Modifications of residential real estate loans, excluding PCI loans, are generally accounted for and reported as TDRs. There were no additional commitments to lend to borrowers whose residential real estate loans, excluding PCI loans, have been modified in TDRs.

The following table presents new TDRs reported by JPMorgan Chase Bank, N.A.

Year ended December 31, (in millions)	**2017**	2016	2015
Residential mortgage	**$ 373**	$ 254	$ 259
Home equity	**321**	385	394
Total residential real estate – excluding PCI	**$ 694**	$ 639	$ 653

Nature and extent of modifications

The U.S. Treasury's Making Home Affordable programs, as well as JPMorgan Chase Bank, N.A.'s proprietary modification programs, generally provide various concessions to financially troubled borrowers including, but not limited to, interest rate reductions, term or payment extensions and deferral of principal and/or interest payments that would otherwise have been required under the terms of the original agreement.

The following table provides information about how residential real estate loans, excluding PCI loans, were modified under JPMorgan Chase Bank, N.A.'s loss mitigation programs described above during the periods presented. This table excludes Chapter 7 loans where the sole concession granted is the discharge of debt.

	Residential mortgage			Home equity			Total residential real estate – excluding PCI		
Year ended Dec. 31,	**2017**	2016	2015	**2017**	2016	2015	**2017**	2016	2015
Number of loans approved for a trial modification	**1,281**	1,936	2,662	**2,321**	3,744	3,916	**3,602**	5,680	6,578
Number of loans permanently modified	**2,624**	3,320	3,080	**5,624**	4,824	4,248	**8,248**	8,144	7,328
Concession granted:[(a)]									
Interest rate reduction	**63%**	76%	71%	**59%**	75%	66%	**60%**	76%	68%
Term or payment extension	**72**	90	81	**69**	83	89	**70**	86	86
Principal and/or interest deferred	**15**	16	26	**10**	19	23	**12**	18	24
Principal forgiveness	**16**	26	28	**13**	9	7	**14**	16	16
Other[(b)]	**33**	25	11	**31**	6	–	**32**	13	5

(a) Represents concessions granted in permanent modifications as a percentage of the number of loans permanently modified. The sum of the percentages exceeds 100% because predominantly all of the modifications include more than one type of concession. A significant portion of trial modifications include interest rate reductions and/or term or payment extensions.
(b) Predominantly represents variable interest rate to fixed interest rate modifications.

Financial effects of modifications and redefaults

The following table provides information about the financial effects of the various concessions granted in modifications of residential real estate loans, excluding PCI, under the loss mitigation programs described above and about redefaults of certain loans modified in TDRs for the periods presented. The following table presents only the final financial effects of permanent modifications and does not include temporary concessions offered through trial modifications. This table also excludes Chapter 7 loans where the sole concession granted is the discharge of debt.

Year ended December 31, (in millions, except weighted-average data and number of loans)	Residential mortgage			Home equity			Total residential real estate – excluding PCI		
	2017	2016	2015	**2017**	2016	2015	**2017**	2016	2015
Weighted-average interest rate of loans with interest rate reductions – before TDR	**5.15%**	5.59%	5.69%	**4.95%**	4.99%	5.21%	**5.06%**	5.36%	5.52%
Weighted-average interest rate of loans with interest rate reductions – after TDR	**2.99**	2.93	2.81	**2.64**	2.34	2.35	**2.83**	2.69	2.65
Weighted-average remaining contractual term (in years) of loans with term or payment extensions – before TDR	**24**	24	25	**21**	18	18	**23**	22	22
Weighted-average remaining contractual term (in years) of loans with term or payment extensions – after TDR	**38**	38	37	**39**	38	35	**38**	38	36
Charge-offs recognized upon permanent modification	**$ 2**	$ 4	$ 11	**$ 1**	$ 1	$ 4	**$ 3**	$ 5	$ 15
Principal deferred	**12**	30	55	**10**	23	26	**22**	53	81
Principal forgiven	**20**	44	66	**13**	7	6	**33**	51	72
Balance of loans that redefaulted within one year of permanent modification(a)	**$ 124**	$ 98	$ 131	**$ 56**	$ 39	$ 21	**$ 180**	$ 137	$ 152

(a) Represents loans permanently modified in TDRs that experienced a payment default in the periods presented, and for which the payment default occurred within one year of the modification. The dollar amounts presented represent the balance of such loans at the end of the reporting period in which such loans defaulted. For residential real estate loans modified in TDRs, payment default is deemed to occur when the loan becomes two contractual payments past due. In the event that a modified loan redefaults, it is probable that the loan will ultimately be liquidated through foreclosure or another similar type of liquidation transaction. Redefaults of loans modified within the last 12 months may not be representative of ultimate redefault levels.

At December 31, 2017, the weighted-average estimated remaining lives of residential real estate loans, excluding PCI loans, permanently modified in TDRs were 14 years for residential mortgage and 10 years for home equity. The estimated remaining lives of these loans reflect estimated prepayments, both voluntary and involuntary (i.e., foreclosures and other forced liquidations).

Active and suspended foreclosure

At December 31, 2017 and 2016, JPMorgan Chase Bank, N.A. had non-PCI residential real estate loans, excluding those insured by U.S. government agencies, with a carrying value of $787 million and $931 million, respectively, that were not included in REO, but were in the process of active or suspended foreclosure.

Other consumer loans

The table below provides information for other consumer retained loan classes, including auto and business banking loans. This table excludes student loans that were sold in 2017.

December 31, (in millions, except ratios)	Auto		Consumer & business banking[c]	
	2017	2016	**2017**	2016
Loan delinquency[a]				
Current	**$ 65,651**	$ 65,029	**$ 25,454**	$ 23,919
30–119 days past due	**584**	773	**213**	247
120 or more days past due	**7**	12	**122**	140
Total retained loans	**$ 66,242**	$ 65,814	**$ 25,789**	$ 24,306
% of 30+ days past due to total retained loans	**0.89%**	1.19%	**1.30%**	1.59%
Nonaccrual loans[a]	**141**	214	**283**	287
Geographic region				
California	**$ 8,445**	$ 7,975	**$ 5,032**	$ 4,426
Texas	**7,013**	7,041	**2,916**	2,954
New York	**4,023**	4,078	**4,195**	3,979
Illinois	**3,916**	3,984	**2,017**	1,758
Florida	**3,350**	3,374	**1,424**	1,195
Arizona	**2,221**	2,209	**1,383**	1,307
Ohio	**2,105**	2,194	**1,380**	1,402
Michigan	**1,418**	1,567	**1,357**	1,343
New Jersey	**2,044**	2,031	**721**	623
Louisiana	**1,656**	1,814	**849**	979
All other	**30,051**	29,547	**4,515**	4,340
Total retained loans	**$ 66,242**	$ 65,814	**$ 25,789**	$ 24,306
Loans by risk ratings[b]				
Noncriticized	**$ 15,604**	$ 13,899	**$ 17,938**	$ 16,858
Criticized performing	**93**	201	**791**	816
Criticized nonaccrual	**9**	94	**213**	217

(a) There were no loans that were 90 or more days past due and still accruing interest at December 31, 2017 and 2016.
(b) For risk-rated business banking and auto loans, the primary credit quality indicator is the risk rating of the loan, including whether the loans are considered to be criticized and/or nonaccrual.
(c) Certain loan portfolios have been reclassified. The prior period amounts have been revised to conform with the current period presentation.

Other consumer impaired loans and loan modifications

The following table sets forth information about JPMorgan Chase Bank, N.A.'s other consumer impaired loans, including risk-rated business banking and auto loans that have been placed on nonaccrual status, and loans that have been modified in TDRs.

December 31, (in millions)	2017	2016
Impaired loans		
With an allowance	$ 272	$ 614
Without an allowance[(a)]	26	30
Total impaired loans[(b)(c)]	$ 298	$ 644
Allowance for loan losses related to impaired loans	$ 73	$ 119
Unpaid principal balance of impaired loans[(d)]	402	753
Impaired loans on nonaccrual status	268	508

(a) When discounted cash flows, collateral value or market price equals or exceeds the recorded investment in the loan, the loan does not require an allowance. This typically occurs when the impaired loans have been partially charged off and/or there have been interest payments received and applied to the loan balance.
(b) Predominantly all other consumer impaired loans are in the U.S.
(c) Other consumer average impaired loans were $427 million, $635 million and $566 million for the years ended December 31, 2017, 2016 and 2015, respectively. The related interest income on impaired loans, including those on a cash basis, was not material for the years ended December 31, 2017, 2016 and 2015.
(d) Represents the contractual amount of principal owed at December 31, 2017 and 2016. The unpaid principal balance differs from the impaired loan balances due to various factors, including charge-offs, interest payments received and applied to the principal balance, net deferred loan fees or costs and unamortized discounts or premiums on purchased loans.

Loan modifications

Certain other consumer loan modifications are considered to be TDRs as they provide various concessions to borrowers who are experiencing financial difficulty. All of these TDRs are reported as impaired loans. The following table provides information about JPMorgan Chase Bank, N.A.'s other consumer loans modified in TDRs. New TDRs were not material for the years ended December 31, 2017 and 2016.

December 31, (in millions)	2017	2016
Loans modified in TDRs[(a)(b)]	$ 102	$ 362
TDRs on nonaccrual status	72	226

(a) The impact of these modifications was not material to JPMorgan Chase Bank, N.A. for the years ended December 31, 2017 and 2016.
(b) Additional commitments to lend to borrowers whose loans have been modified in TDRs as of December 31, 2017 and 2016 were immaterial.

Purchased credit-impaired loans

PCI loans are initially recorded at fair value at acquisition. PCI loans acquired in the same fiscal quarter may be aggregated into one or more pools, provided that the loans have common risk characteristics. A pool is then accounted for as a single asset with a single composite interest rate and an aggregate expectation of cash flows. With respect to the Washington Mutual transaction, all of the consumer PCI loans were aggregated into pools of loans with common risk characteristics.

On a quarterly basis, JPMorgan Chase Bank, N.A. estimates the total cash flows (both principal and interest) expected to be collected over the remaining life of each pool. These estimates incorporate assumptions regarding default rates, loss severities, the amounts and timing of prepayments and other factors that reflect then-current market conditions. Probable decreases in expected cash flows (i.e., increased credit losses) trigger the recognition of impairment, which is then measured as the present value of the expected principal loss plus any related forgone interest cash flows, discounted at the pool's effective interest rate. Impairments are recognized through the provision for credit losses and an increase in the allowance for loan losses. Probable and significant increases in expected cash flows (e.g., decreased credit losses, the net benefit of modifications) would first reverse any previously recorded allowance for loan losses with any remaining increases recognized prospectively as a yield adjustment over the remaining estimated lives of the underlying loans. The impacts of (i) prepayments, (ii) changes in variable interest rates, and (iii) any other changes in the timing of expected cash flows are generally recognized prospectively as adjustments to interest income.

JPMorgan Chase Bank, N.A. continues to modify certain PCI loans. The impact of these modifications is incorporated into JPMorgan Chase Bank, N.A.'s quarterly assessment of whether a probable and significant change in expected cash flows has occurred, and the loans continue to be accounted for and reported as PCI loans. In evaluating the effect of modifications on expected cash flows, JPMorgan Chase Bank, N.A. incorporates the effect of any forgone interest and also considers the potential for redefault. JPMorgan Chase Bank, N.A. develops product-specific probability of default estimates, which are used to compute expected credit losses. In developing these probabilities of default, JPMorgan Chase Bank, N.A. considers the relationship between the credit quality characteristics of the underlying loans and certain assumptions about home prices and unemployment based upon industry-wide data. JPMorgan Chase Bank, N.A. also considers its own historical loss experience to-date based on actual redefaulted modified PCI loans.

The excess of cash flows expected to be collected over the carrying value of the underlying loans is referred to as the accretable yield. This amount is not reported on JPMorgan Chase Bank, N.A.'s Consolidated balance sheets but is accreted into interest income at a level rate of return over the remaining estimated lives of the underlying pools of loans.

If the timing and/or amounts of expected cash flows on PCI loan pools were determined not to be reasonably estimable, no interest would be accreted and the loan pools would be reported as nonaccrual loans; however, since the timing and amounts of expected cash flows for JPMorgan Chase Bank, N.A.'s PCI consumer loan pools are reasonably estimable, interest is being accreted and the loan pools are being reported as performing loans.

The liquidation of PCI loans, which may include sales of loans, receipt of payment in full from the borrower, or foreclosure, results in removal of the loans from the underlying PCI pool. When the amount of the liquidation proceeds (e.g., cash, real estate), if any, is less than the unpaid principal balance of the loan, the difference is first applied against the PCI pool's nonaccretable difference for principal losses (i.e., the lifetime credit loss estimate established as a purchase accounting adjustment at the acquisition date). When the nonaccretable difference for a particular loan pool has been fully depleted, any excess of the unpaid principal balance of the loan over the liquidation proceeds is written off against the PCI pool's allowance for loan losses. Write-offs of PCI loans also include other adjustments, primarily related to interest forgiveness modifications. Because JPMorgan Chase Bank, N.A.'s PCI loans are accounted for at a pool level, JPMorgan Chase Bank, N.A. does not recognize charge-offs of PCI loans when they reach specified stages of delinquency (i.e., unlike non-PCI consumer loans, these loans are not charged off based on FFIEC standards).

The PCI portfolio affects JPMorgan Chase Bank, N.A.'s results of operations primarily through: (i) contribution to net interest margin; (ii) expense related to defaults and servicing resulting from the liquidation of the loans; and (iii) any provision for loan losses. The PCI loans acquired in the Washington Mutual transaction were funded based on the interest rate characteristics of the loans. For example, variable-rate loans were funded with variable-rate liabilities and fixed-rate loans were funded with fixed-rate liabilities with a similar maturity profile. A net spread will be earned on the declining balance of the portfolio, which is estimated as of December 31, 2017, to have a remaining weighted-average life of 9 years.

Residential real estate – PCI loans

The table below sets forth information about JPMorgan Chase Bank, N.A.'s consumer, excluding credit card, PCI loans.

December 31, (in millions, except ratios)	Home equity		Prime mortgage		Subprime mortgage		Option ARMs		Total PCI	
	2017	2016	**2017**	2016	**2017**	2016	**2017**	2016	**2017**	2016
Carrying value[(a)]	**$10,799**	$12,902	**$ 6,479**	$ 7,602	**$ 2,609**	$ 2,941	**$10,689**	$12,234	**$30,576**	$35,679
Related allowance for loan losses[(b)]	**1,133**	1,433	**863**	829	**150**	–	**79**	49	**2,225**	2,311
Loan delinquency (based on unpaid principal balance)										
Current	**$10,272**	$12,423	**$ 5,839**	$ 6,840	**$ 2,640**	$ 3,005	**$ 9,662**	$11,074	**$28,413**	$33,342
30–149 days past due	**356**	291	**336**	336	**381**	361	**547**	555	**1,620**	1,543
150 or more days past due	**392**	478	**327**	451	**176**	240	**689**	917	**1,584**	2,086
Total loans	**$11,020**	$13,192	**$ 6,502**	$ 7,627	**$ 3,197**	$ 3,606	**$10,898**	$12,546	**$31,617**	$36,971
% of 30+ days past due to total loans	**6.79%**	5.83%	**10.20%**	10.32%	**17.42%**	16.67%	**11.34%**	11.73%	**10.13%**	9.82%
Current estimated LTV ratios (based on unpaid principal balance)[(c)(d)]										
Greater than 125% and refreshed FICO scores:										
Equal to or greater than 660	**$ 33**	$ 69	**$ 4**	$ 6	**$ 2**	$ 7	**$ 6**	$ 12	**$ 45**	$ 94
Less than 660	**21**	39	**16**	17	**20**	31	**9**	18	**66**	105
101% to 125% and refreshed FICO scores:										
Equal to or greater than 660	**274**	555	**16**	52	**20**	39	**43**	83	**353**	729
Less than 660	**132**	256	**42**	84	**75**	135	**71**	144	**320**	619
80% to 100% and refreshed FICO scores:										
Equal to or greater than 660	**1,195**	1,860	**221**	442	**119**	214	**316**	558	**1,851**	3,074
Less than 660	**559**	804	**230**	381	**309**	439	**371**	609	**1,469**	2,233
Lower than 80% and refreshed FICO scores:										
Equal to or greater than 660	**6,134**	6,676	**3,551**	3,967	**895**	919	**6,113**	6,754	**16,693**	18,316
Less than 660	**2,095**	2,183	**2,103**	2,287	**1,608**	1,645	**3,499**	3,783	**9,305**	9,898
No FICO/LTV available	**577**	750	**319**	391	**149**	$ 177	**$ 470**	$ 585	**1,515**	1,903
Total unpaid principal balance	**$11,020**	$13,192	**$ 6,502**	$ 7,627	**$ 3,197**	$ 3,606	**$10,898**	$12,546	**$31,617**	$36,971
Geographic region (based on unpaid principal balance)										
California	**$ 6,555**	$ 7,899	**$ 3,716**	$ 4,396	**$ 797**	$ 899	**$ 6,225**	$ 7,128	**$17,293**	$20,322
Florida	**1,137**	1,306	**428**	501	**296**	332	**878**	1,026	**2,739**	$ 3,165
New York	**607**	697	**457**	515	**330**	363	**628**	711	**2,022**	$ 2,286
Washington	**532**	673	**135**	167	**61**	68	**238**	290	**966**	$ 1,198
Illinois	**273**	314	**200**	226	**161**	178	**249**	282	**883**	$ 1,000
New Jersey	**242**	280	**178**	210	**110**	125	**336**	401	**866**	$ 1,016
Massachusetts	**79**	94	**149**	173	**98**	110	**307**	346	**633**	$ 723
Maryland	**57**	64	**129**	144	**132**	145	**232**	267	**550**	$ 620
Arizona	**203**	241	**106**	124	**60**	68	**156**	181	**525**	$ 614
Virginia	**66**	77	**123**	142	**51**	56	**280**	314	**520**	$ 589
All other	**1,269**	1,547	**881**	1,029	**1,101**	1,262	**1,369**	1,600	**4,620**	$ 5,438
Total unpaid principal balance	**$11,020**	$13,192	**$ 6,502**	$ 7,627	**$ 3,197**	$ 3,606	**$10,898**	$12,546	**$31,617**	$36,971

(a) Carrying value includes the effect of fair value adjustments that were applied to the consumer PCI portfolio at the date of acquisition.
(b) Management concluded as part of JPMorgan Chase Bank, N.A.'s regular assessment of the PCI loan pools, that it was probable that higher expected credit losses would result in a decrease in expected cash flows. As a result, an allowance for loan losses for impairment of these pools has been recognized.
(c) Represents the aggregate unpaid principal balance of loans divided by the estimated current property value. Current property values are estimated, at a minimum, quarterly, based on home valuation models using nationally recognized home price index valuation estimates incorporating actual data to the extent available and forecasted data where actual data is not available. These property values do not represent actual appraised loan level collateral values; as such, the resulting ratios are necessarily imprecise and should be viewed as estimates. Current estimated combined LTV for junior lien home equity loans considers all available lien positions, as well as unused lines, related to the property.
(d) Refreshed FICO scores represent each borrower's most recent credit score, which is obtained by JPMorgan Chase Bank, N.A. on at least a quarterly basis.

Approximately 25% of the PCI home equity portfolio are senior lien loans; the remaining balance are junior lien HELOANs or HELOCs. The following table sets forth delinquency statistics for PCI junior lien home equity loans and lines of credit based on the unpaid principal balance as of December 31, 2017 and 2016.

December 31,	Total loans		Total 30+ day delinquency rate	
(in millions, except ratios)	**2017**	2016	**2017**	2016
HELOCs:[a]				
Within the revolving period[b]	**$ 51**	$ 2,126	**1.96%**	3.67%
Beyond the revolving period	**7,875**	7,452	**4.63**	4.03
HELOANs	**360**	465	**5.28**	5.38
Total	**$ 8,286**	$ 10,043	**4.65%**	4.01%

(a) In general, these HELOCs are revolving loans for a 10-year period, after which time the HELOC converts to an interest-only loan with a balloon payment at the end of the loan's term.
(b) Substantially all undrawn HELOCs within the revolving period have been closed.
(c) Includes loans modified into fixed rate amortizing loans.

The table below sets forth the accretable yield activity for JPMorgan Chase Bank, N.A.'s PCI consumer loans for the years ended December 31, 2017, 2016 and 2015, and represents JPMorgan Chase Bank, N.A.'s estimate of gross interest income expected to be earned over the remaining life of the PCI loan portfolios. The table excludes the cost to fund the PCI portfolios, and therefore the accretable yield does not represent net interest income expected to be earned on these portfolios.

Year ended December 31,	Total PCI		
(in millions, except ratios)	**2017**	2016	2015
Beginning balance	**$ 11,768**	$ 13,491	$ 14,592
Accretion into interest income	**(1,396)**	(1,555)	(1,700)
Changes in interest rates on variable-rate loans	**503**	260	279
Other changes in expected cash flows[a]	**284**	(428)	230
Reclassification from nonaccretable difference[b]	**—**	—	$ 90
Balance at December 31	**$ 11,159**	$ 11,768	$ 13,491
Accretable yield percentage	**4.53%**	4.35%	4.20%

(a) Other changes in expected cash flows may vary from period to period as JPMorgan Chase Bank, N.A. continues to refine its cash flow model, for example cash flows expected to be collected due to the impact of modifications and changes in prepayment assumptions.
(b) Reclassifications from the nonaccretable difference in the year ended December 31, 2015 were driven by continued improvement in home prices and delinquencies, as well as increased granularity in the impairment estimates.

Active and suspended foreclosure

At December 31, 2017 and 2016, JPMorgan Chase Bank, N.A. had PCI residential real estate loans with an unpaid principal balance of $1.3 billion and $1.7 billion, respectively, that were not included in REO, but were in the process of active or suspended foreclosure.

Credit card loan portfolio

The credit card portfolio predominantly includes credit card loans acquired pursuant to a participation agreement with Chase Bank USA, N.A., a related-party, and subsequent draws on revolving credit lines associated with the participation agreement. Delinquency rates are the primary credit quality indicator for credit card loans as they provide an early warning that borrowers may be experiencing difficulties (30 days past due); information on those borrowers that have been delinquent for a longer period of time (90 days past due) is also considered. In addition to delinquency rates, the geographic distribution of the loans provides insight as to the credit quality of the portfolio based on the regional economy.

While the borrower's credit score is another general indicator of credit quality, JPMorgan Chase Bank, N.A. does not view credit scores as a primary indicator of credit quality because the borrower's credit score tends to be a lagging indicator. The distribution of such scores provides a general indicator of credit quality trends within the portfolio; however, the score does not capture all factors that would be predictive of future credit performance. Refreshed FICO score information, which is obtained at least quarterly, for a statistically significant random sample of the credit card portfolio is indicated in the following table. FICO is considered to be the industry benchmark for credit scores.

The credit card portfolio generally includes accounts to prime consumer borrowers. However, certain cardholders' FICO scores may decrease over time, depending on the performance of the cardholder and changes in credit score calculation.

The table below sets forth information about JPMorgan Chase Bank, N.A.'s credit card loans.

As of or for the year ended December 31, (in millions, except ratios)	2017	2016
Net charge-offs	**$ 1,140**	$ 876
% of net charge-offs to retained loans	**3.08%**	2.66%
Loan delinquency		
Current and less than 30 days past due and still accruing	**$ 40,092**	$ 35,137
30–89 days past due and still accruing	**397**	315
90 or more days past due and still accruing	**422**	321
Total retained credit card loans	**$ 40,911**	$ 35,773
Loan delinquency ratios		
% of 30+ days past due to total retained loans	**2.00%**	1.78%
% of 90+ days past due to total retained loans	**1.03**	0.90
Credit card loans by geographic region		
California	**$ 6,428**	$ 5,483
Texas	**4,121**	3,574
New York	**3,689**	3,197
Florida	**2,581**	2,238
Illinois	**2,294**	2,022
New Jersey	**1,762**	1,574
Ohio	**1,268**	1,145
Pennsylvania	**1,256**	1,140
Colorado	**1,141**	971
Michigan	**992**	889
All other	**15,379**	13,540
Total retained credit card loans	**$ 40,911**	$ 35,773
Percentage of portfolio based on carrying value with estimated refreshed FICO scores		
Equal to or greater than 660	**84.2%**	84.7%
Less than 660	**14.4**	13.9
No FICO available	**1.4**	1.4

Credit card impaired loans and loan modifications

The table below sets forth information about JPMorgan Chase Bank, N.A.'s impaired credit card loans. All of these loans are considered to be impaired as they have been modified in TDRs.

December 31, (in millions)	2017	2016
Impaired credit card loans with an allowance[(a)(b)]		
Credit card loans with modified payment terms[(c)]	**$ 297**	$ 254
Modified credit card loans that have reverted to pre-modification payment terms[(d)]	**16**	31
Total impaired credit card loans[(e)]	**$ 313**	$ 285
Allowance for loan losses related to impaired credit card loans	**$ 99**	$ 83

(a) The carrying value and the unpaid principal balance are the same for credit card impaired loans.
(b) There were no impaired loans without an allowance.
(c) Represents credit card loans outstanding to borrowers enrolled in a credit card modification program as of the date presented.
(d) Represents credit card loans that were modified in TDRs but that have subsequently reverted back to the loans' pre-modification payment terms. At both December 31, 2017 and 2016, $10 million and $22 million, respectively, of loans have reverted back to the pre-modification payment terms of the loans due to noncompliance with the terms of the modified loans. The remaining $7 million and $9 million at December 31, 2017 and 2016, respectively, of these loans are to borrowers who have successfully completed a short-term modification program. JPMorgan Chase Bank, N.A. continues to report these loans as TDRs since the borrowers' credit lines remain closed.
(e) Predominantly all impaired credit card loans are in the U.S.

The following table presents average balances of impaired credit card loans and interest income recognized on those loans.

Year ended December 31, (in millions)	2017	2016	2015
Average impaired credit card loans	**$ 295**	$ 288	$ 325
Interest income on impaired credit card loans	**14**	14	15

Loan modifications

Credit card borrowers, who are experiencing financial difficulty may be offered a number of loan modification programs. Modifications under long-term programs involve placing the customer on a fixed payment plan, generally for 60 months. Short-term programs may be offered for borrowers who may be in need of temporary relief; however, none are currently being offered. Modifications under all short- and long-term programs typically include reducing the interest rate on the credit card. Substantially all modifications are considered to be TDRs.

If the cardholder does not comply with the modified payment terms, then the credit card loan continues to age and will ultimately be charged-off in accordance with JPMorgan Chase Bank, N.A.'s standard charge-off policy. In most cases, JPMorgan Chase Bank, N.A. does not reinstate the borrower's line of credit.

New enrollments in these loan modification programs for the years ended December 31, 2017, 2016 and 2015, were $184 million, $139 million and $111 million, respectively.

Financial effects of modifications and redefaults

The following table provides information about the financial effects of the concessions granted on credit card loans modified in TDRs and redefaults for the periods presented.

Year ended December 31, (in millions, except weighted-average data)	2017	2016	2015
Weighted-average interest rate of loans – before TDR	**16.59%**	15.56%	14.77%
Weighted-average interest rate of loans – after TDR	**4.89**	4.76	4.40
Loans that redefaulted within one year of modification[(a)]	**$ 18**	$ 17	$ 16

(a) Represents loans modified in TDRs that experienced a payment default in the periods presented, and for which the payment default occurred within one year of the modification. The amounts presented represent the balance of such loans as of the end of the interim period in which they defaulted.

For credit card loans modified in TDRs, a substantial portion of these loans are expected to be charged-off in accordance with JPMorgan Chase Bank, N.A.'s standard charge-off policy. Based on historical experience, the estimated weighted-average default rate for modified credit card loans was expected to be 31.54%, 28.87% and 25.08% as of December 31, 2017, 2016 and 2015, respectively.

Wholesale loan portfolio

Wholesale loans include loans made to a variety of clients, ranging from large corporate and institutional clients to high-net-worth individuals.

The primary credit quality indicator for wholesale loans is the risk rating assigned to each loan. Risk ratings are used to identify the credit quality of loans and differentiate risk within the portfolio. Risk ratings on loans consider the probability of default ("PD") and the loss given default ("LGD"). The PD is the likelihood that a loan will default. The LGD is the estimated loss on the loan that would be realized upon the default of the borrower and takes into consideration collateral and structural support for each credit facility.

Management considers several factors to determine an appropriate risk rating, including the obligor's debt capacity and financial flexibility, the level of the obligor's earnings, the amount and sources for repayment, the level and nature of contingencies, management strength, and the industry and geography in which the obligor operates. JPMorgan Chase Bank, N.A.'s definition of criticized aligns with the banking regulatory definition of criticized exposures, which consist of special mention, substandard and doubtful categories. Risk ratings generally represent ratings profiles similar to those defined by S&P and Moody's. Investment-grade ratings range from "AAA/Aaa" to "BBB-/Baa3." Noninvestment-grade ratings are classified as noncriticized ("BB+/Ba1 and B-/B3") and criticized ("CCC+"/"Caa1 and below"), and the criticized portion is further subdivided into performing and nonaccrual loans, representing management's assessment of the collectibility of principal and interest. Criticized loans have a higher probability of default than noncriticized loans.

Risk ratings are reviewed on a regular and ongoing basis by Credit Risk Management and are adjusted as necessary for updated information affecting the obligor's ability to fulfill its obligations.

As noted above, the risk rating of a loan considers the industry in which the obligor conducts its operations. As part of the overall credit risk management framework, JPMorgan Chase Bank, N.A. focuses on the management and diversification of its industry and client exposures, with particular attention paid to industries with actual or potential credit concern. See Note 5 for further detail on industry concentrations.

The table below provides information by class of receivable for the retained loans in the Wholesale portfolio segment.

In 2017 JPMorgan Chase Bank, N.A. revised its methodology for the assignment of industry classifications, to better monitor and manage concentrations. This largely resulted in the re-assignment of holding companies from Other to the industry of risk category based on the primary business activity of the holding company's underlying entities. In the tables and industry discussions below, the prior period amounts have been revised to conform with the current period presentation.
Below are summaries of JPMorgan Chase Bank, N.A's exposures as of December 31, 2017 and 2016. For additional information on industry concentrations, see Note 5.

As of or for the year ended December 31, (in millions, except ratios)	Commercial and industrial		Real estate		Financial institutions		Government agencies		Other[(d)]		Total retained loans	
	2017	2016	**2017**	2016	**2017**	2016	**2017**	2016	**2017**	2016	**2017**	2016
Loans by risk ratings												
Investment-grade	**$ 67,378**	$ 64,832	**$ 98,467**	$ 88,649	**$ 32,559**	$ 29,403	**$ 14,440**	$ 15,053	**$ 103,186**	$ 95,317	**$ 316,030**	$ 293,254
Noninvestment-grade:												
Noncriticized	**46,499**	47,330	**14,329**	16,149	**12,880**	10,961	**342**	423	**10,066**	9,708	**84,116**	84,571
Criticized performing	**3,933**	6,187	**710**	798	**206**	200	**–**	6	**259**	162	**5,108**	7,353
Criticized nonaccrual	**1,296**	1,490	**136**	200	**2**	9	**–**	–	**238**	255	**1,672**	1,954
Total noninvestment-grade	**51,728**	55,007	**15,175**	17,147	**13,088**	11,170	**342**	429	**10,563**	10,125	**90,896**	93,878
Total retained loans	**$ 119,106**	$ 119,839	**$ 113,642**	$ 105,796	**$ 45,647**	$ 40,573	**$ 14,782**	$ 15,482	**$ 113,749**	$ 105,442	**$ 406,926**	$ 387,132
% of total criticized to total retained loans	**4.39%**	6.41%	**0.74%**	0.94 %	**0.46%**	0.52%	**–%**	0.04%	**0.44%**	0.40%	**1.67%**	2.40%
% of nonaccrual loans to total retained loans	**1.09**	1.24	**0.12**	0.19	**–**	0.02	**–**	–	**0.21**	0.24	**0.41**	0.50
Loans by geographic distribution[(a)]												
Total non-U.S.	**$ 28,470**	$ 30,564	**$ 3,101**	$ 3,303	**$ 16,786**	$ 15,138	**$ 2,905**	$ 3,726	**$ 44,111**	$ 38,774	**$ 95,373**	$ 91,505
Total U.S.	**90,636**	89,275	**110,541**	102,493	**28,861**	25,435	**11,877**	11,756	**69,638**	66,668	**311,553**	295,627
Total retained loans	**$ 119,106**	$ 119,839	**$ 113,642**	$ 105,796	**$ 45,647**	$ 40,573	**$ 14,782**	$ 15,482	**$ 113,749**	$ 105,442	**$ 406,926**	$ 387,132
Net charge-offs/ (recoveries)	**$ 117**	$ 345	**$ (4)**	$ (7)	**$ 6**	$ (1)	**$ 5**	$ (1)	**$ (5)**	$ 6	**$ 119**	$ 342
% of net charge-offs/ (recoveries) to end-of-period retained loans	**0.10%**	0.28%	**–%**	(0.01)%	**0.01%**	–%	**0.03%**	–%	**–%**	0.01%	**0.03%**	0.09%
Loan delinquency[(b)]												
Current and less than 30 days past due and still accruing	**$ 117,486**	$ 117,995	**$ 113,251**	$ 105,390	**$ 45,615**	$ 40,518	**$ 14,770**	$ 15,371	**$ 112,612**	$ 104,591	**$ 403,734**	$ 383,865
30–89 days past due and still accruing	**216**	268	**242**	204	**15**	25	**8**	107	**898**	582	**1,379**	1,186
90 or more days past due and still accruing[(c)]	**108**	86	**13**	2	**15**	21	**4**	4	**1**	14	**141**	127
Criticized nonaccrual	**1,296**	1,490	**136**	200	**2**	9	**–**	–	**238**	255	**1,672**	1,954
Total retained loans	**$ 119,106**	$ 119,839	**$ 113,642**	$ 105,796	**$ 45,647**	$ 40,573	**$ 14,782**	$ 15,482	**$ 113,749**	$ 105,442	**$ 406,926**	$ 387,132

(a) The U.S. and non-U.S. distribution is determined based predominantly on the domicile of the borrower.
(b) The credit quality of wholesale loans is assessed primarily through ongoing review and monitoring of an obligor's ability to meet contractual obligations rather than relying on the past due status, which is generally a lagging indicator of credit quality.
(c) Represents loans that are considered well-collateralized and therefore still accruing interest.
(d) Other includes: individuals; SPEs; holding companies; and private education and civic organizations. For more information on exposures to SPEs, see Note 15.

The following table presents additional information on the real estate class of loans within the Wholesale portfolio for the periods indicated. Exposure consists primarily of secured commercial loans, of which multifamily is the largest segment. Multifamily lending finances acquisition, leasing and construction of apartment buildings, and includes exposure to real estate investment trusts ("REITs"). Other commercial lending largely includes financing for acquisition, leasing and construction, largely for office, retail and industrial real estate, and includes exposure to REITs. Included in real estate loans is $10.8 billion and $9.2 billion as of December 31, 2017 and 2016, respectively, of construction and development exposure consisting of loans originally purposed for construction and development, general purpose loans for builders, as well as loans for land subdivision and pre-development.

December 31, (in millions, except ratios)	Multifamily		Other Commercial		Total real estate loans	
	2017	2016	**2017**	2016	**2017**	2016
Real estate retained loans	**$ 77,597**	$ 72,143	**$ 36,045**	$ 33,653	**$ 113,642**	$ 105,796
Criticized	**491**	539	**355**	459	**846**	998
% of criticized to total real estate retained loans	**0.63%**	0.75%	**0.98%**	1.36%	**0.74%**	0.94%
Criticized nonaccrual	**$ 44**	$ 57	**$ 92**	$ 143	**$ 136**	$ 200
% of criticized nonaccrual to total real estate retained loans	**0.06%**	0.08%	**0.26%**	0.42%	**0.12%**	0.19%

Wholesale impaired loans and loan modifications

Wholesale impaired loans consist of loans that have been placed on nonaccrual status and/or that have been modified in a TDR. All impaired loans are evaluated for an asset-specific allowance as described in Note 14.

The table below sets forth information about JPMorgan Chase Bank, N.A.'s wholesale impaired loans.

December 31, (in millions)	Commercial and industrial		Real estate		Financial institutions		Government agencies		Other		Total retained loans	
	2017	2016	**2017**	2016	**2017**	2016	**2017**	2016	**2017**	2016	**2017**	2016
Impaired loans												
With an allowance	**$ 1,111**	$ 1,127	**$ 79**	$ 124	**$ 93**	$ 9	**$ –**	$ –	**$ 168**	$ 180	**$ 1,451**	$ 1,440
Without an allowance[(a)]	**227**	414	**60**	87	**–**	–	**–**	–	**70**	76	**357**	577
Total impaired loans	**$ 1,338**	$ 1,541	**$ 139**	$ 211	**$ 93**	$ 9	**$ –**	$ –	**$ 238**	$ 256	**$ 1,808** (c)	$ 2,017 (c)
Allowance for loan losses related to impaired loans	**$ 372**	$ 258	**$ 11**	$ 18	**$ 4**	$ 3	**$ –**	$ –	**$ 43**	$ 63	**$ 430**	$ 342
Unpaid principal balance of impaired loans[(b)]	**1,604**	1,754	**201**	295	**94**	12	**–**	–	**255**	284	**2,154**	2,345

(a) When the discounted cash flows, collateral value or market price equals or exceeds the recorded investment in the loan, the loan does not require an allowance. This typically occurs when the impaired loans have been partially charged-off and/or there have been interest payments received and applied to the loan balance.
(b) Represents the contractual amount of principal owed at December 31, 2017 and 2016. The unpaid principal balance differs from the impaired loan balances due to various factors, including charge-offs; interest payments received and applied to the carrying value; net deferred loan fees or costs; and unamortized discount or premiums on purchased loans.
(c) Based upon the domicile of the borrower, largely consists of loans in the U.S.

The following table presents JPMorgan Chase Bank, N.A.'s average impaired loans for the years ended 2017, 2016 and 2015.

Year ended December 31, (in millions)	**2017**	2016	2015
Commercial and industrial	**$ 1,145**	$ 1,478	$ 453
Real estate	**164**	210	249
Financial institutions	**20**	13	13
Government agencies	**–**	–	1
Other	**231**	213	129
Total[(a)]	**$ 1,560**	$ 1,914	$ 845

(a) The related interest income on accruing impaired loans and interest income recognized on a cash basis were not material for the years ended December 31, 2017, 2016 and 2015.

Certain loan modifications are considered to be TDRs as they provide various concessions to borrowers who are experiencing financial difficulty. All TDRs are reported as impaired loans in the tables above. TDRs were $614 million and $733 million as of December 31, 2017 and 2016.

Note 14 – Allowance for credit losses

JPMorgan Chase Bank, N.A.'s allowance for loan losses represents management's estimate of probable credit losses inherent in the JPMorgan Chase Bank, N.A.'s retained loan portfolio, which consists of the two consumer portfolio segments (primarily scored) and the wholesale portfolio segment (risk-rated). JPMorgan Chase Bank, N.A.'s The allowance for loan losses includes a formula-based component, an asset-specific component, and a component related to PCI loans, as described below. Management also estimates an allowance for wholesale and certain consumer lending-related commitments using methodologies similar to those used to estimate the allowance on the underlying loans.

During the first half of 2017, JPMorgan Chase Bank, N.A refined its credit loss estimates relating to the wholesale portfolio by incorporating the use of internal historical data versus external credit rating agency default statistics to estimate Probability of Default ("PD"). In addition, an adjustment to the statistical calculation for wholesale lending-related commitments was incorporated similar to the adjustment applied for wholesale loans. The impacts of these refinements were not material to the allowance for credit losses. JPMorgan Chase Bank, N.A.'s policies used to determine its allowance for credit losses are described in the following paragraphs.

Determining the appropriateness of the allowance is complex and requires judgment by management about the effect of matters that are inherently uncertain. Subsequent evaluations of the loan portfolio, in light of the factors then prevailing, may result in significant changes in the allowances for loan losses and lending-related commitments in future periods. At least quarterly, the allowance for credit losses is reviewed by the CRO, the Chief Financial Officer ("CFO") and the Controller of JPMorgan Chase and discussed with the DRPC and the Audit Committee JPMorgan Chase Bank, N.A. As of December 31, 2017, JPMorgan Chase Bank, N.A. deemed the allowance for credit losses to be appropriate (i.e., sufficient to absorb probable credit losses inherent in the portfolio).

Formula-based component

The formula-based component is based on a statistical calculation to provide for incurred credit losses in all consumer loans and performing risk-rated loans. All loans restructured in TDRs as well as any impaired risk-rated loans have an allowance assessed as part of the asset-specific component, while PCI loans have an allowance assessed as part of the PCI component. See Note 13 for more information on TDRs, Impaired loans and PCI loans.

Formula-based component - Consumer loans and certain lending-related commitments

The formula-based allowance for credit losses for the consumer portfolio segments is calculated by applying statistical credit loss factors (estimated PD and loss severities) to the recorded investment balances or loan-equivalent amounts of pools of loan exposures with similar risk characteristics over a loss emergence period to arrive at an estimate of incurred credit losses. Estimated loss emergence periods may vary by product and may change over time; management applies judgment in estimating loss emergence periods, using available credit information and trends. In addition, management applies judgment to the statistical loss estimates for each loan portfolio category, using delinquency trends and other risk characteristics to estimate the total incurred credit losses in the portfolio. Management uses additional statistical methods and considers actual portfolio performance, including actual losses recognized on defaulted loans and collateral valuation trends, to review the appropriateness of the primary statistical loss estimate. The economic impact of potential modifications of residential real estate loans is not included in the statistical calculation because of the uncertainty regarding the type and results of such modifications.

The statistical calculation is then adjusted to take into consideration model imprecision, external factors and current economic events that have occurred but that are not yet reflected in the factors used to derive the statistical calculation; these adjustments are accomplished in part by analyzing the historical loss experience for each major product segment. However, it is difficult to predict whether historical loss experience is indicative of future loss levels. Management applies judgment in making this adjustment, taking into account uncertainties associated with current macroeconomic and political conditions, quality of underwriting standards, borrower behavior, and other relevant internal and external factors affecting the credit quality of the portfolio. In certain instances, the interrelationships between these factors create further uncertainties. The application of different inputs into the statistical calculation, and the assumptions used by management to adjust the statistical calculation, are subject to management judgment, and emphasizing one input or assumption over another, or considering other inputs or assumptions, could affect the estimate of the allowance for credit losses for the consumer credit portfolio.

Overall, the allowance for credit losses for consumer portfolios is sensitive to changes in the economic environment (e.g., unemployment rates), delinquency rates, the realizable value of collateral (e.g., housing prices), FICO scores, borrower behavior and other risk factors. While all of these factors are important determinants of overall allowance levels, changes in the various factors may not occur at the same time or at the same rate, or changes may be directionally inconsistent such that improvement in one factor may offset deterioration in another. In addition, changes in these factors would not necessarily be consistent across all geographies or product types. Finally, it is difficult to predict the extent to which changes in these factors would ultimately affect the frequency of losses, the severity of losses or both.

Formula-based component - Wholesale loans and lending-related commitments
JPMorgan Chase Bank, N.A.'s methodology for determining the allowance for loan losses and the allowance for lending-related commitments involves the early identification of credits that are deteriorating. The formula-based component of the allowance for wholesale loans and lending-related commitments is calculated by applying statistical credit loss factors (estimated PD and LGD) to the recorded investment balances or loan-equivalent over a loss emergence period to arrive at an estimate of incurred credit losses in the portfolio. Estimated loss emergence periods may vary by funded versus unfunded status of the instrument and may change over time.

JPMorgan Chase Bank, N.A. assesses the credit quality of its borrower or counterparty and assigns a risk rating. Risk ratings are assigned at origination or acquisition, and if necessary, adjusted for changes in credit quality over the life of the exposure. In assessing the risk rating of a particular loan or lending-related commitment, among the factors considered are the obligor's debt capacity and financial flexibility, the level of the obligor's earnings, the amount and sources for repayment, the level and nature of contingencies, management strength, and the industry and geography in which the obligor operates. These factors are based on an evaluation of historical and current information and involve subjective assessment and interpretation. Determining risk ratings involves significant judgment; emphasizing one factor over another or considering additional factors could affect the risk rating assigned by JPMorgan Chase Bank, N.A.

A PD estimate is determined based on the JPMorgan Chase Bank, N.A.'s history of defaults over more than one credit cycle.

LGD estimate is a judgment-based estimate assigned to each loan or lending-related commitment. The estimate represents the amount of economic loss if the obligor were to default. The type of obligor, quality of collateral, and the seniority of JPMorgan Chase Bank, N.A.'s lending exposure in the obligor's capital structure affect LGD.

JPMorgan Chase Bank, N.A. applies judgment in estimating PD, LGD, loss emergence period and loan-equivalent used in calculating the allowance for credit losses. Estimates of PD, LGD, loss emergence period and loan-equivalent used are subject to periodic refinement based on any changes to underlying external or JPMorgan Chase Bank, N.A.-specific historical data. Changes to the time period used for PD and LGD estimates could also affect the allowance for credit losses. The use of different inputs, estimates or methodologies could change the amount of the allowance for credit losses determined appropriate by JPMorgan Chase Bank, N.A.

In addition to the statistical credit loss estimates applied to the wholesale portfolio, management applies its judgment to adjust the statistical estimates for wholesale loans and lending-related commitments, taking into consideration model imprecision, external factors and economic events that have occurred but are not yet reflected in the loss factors. Historical experience of both LGD and PD are considered when estimating these adjustments. Factors related to concentrated and deteriorating industries also are incorporated where relevant. These estimates are based on management's view of uncertainties that relate to current macroeconomic conditions, quality of underwriting standards and other relevant internal and external factors affecting the credit quality of the current portfolio.

Asset-specific component
The asset-specific component of the allowance relates to loans considered to be impaired, which includes loans that have been modified in TDRs as well as risk-rated loans that have been placed on nonaccrual status. To determine the asset-specific component of the allowance, larger risk-rated loans (primarily loans in the wholesale portfolio segment) are evaluated individually, while smaller loans (both risk-rated and scored) are evaluated as pools using historical loss experience for the respective class of assets.

JPMorgan Chase Bank, N.A. generally measures the asset-specific allowance as the difference between the recorded investment in the loan and the present value of the cash flows expected to be collected, discounted at the loan's original effective interest rate. Subsequent changes in impairment are reported as an adjustment to the allowance for loan losses. In certain cases, the asset-specific allowance is determined using an observable market price, and the allowance is measured as the difference between the recorded investment in the loan and the loan's fair value. Collateral-dependent loans are charged down to the fair value of collateral less costs to sell. For any of these impaired loans, the amount of the asset-specific allowance required to be recorded, if any, is dependent upon the recorded investment in the loan (including prior charge-offs), and either the expected cash flows or fair value of collateral. See Note 13 for more information about charge-offs and collateral-dependent loans.

The asset-specific component of the allowance for impaired loans that have been modified in TDRs (including forgone interest, principal forgiveness, as well as other concessions) incorporates the effect of the modification on the loan's expected cash flows, which considers the potential for redefault. For residential real estate loans modified in TDRs, JPMorgan Chase Bank, N.A. develops product-specific probability of default estimates, which are applied at a loan level to compute expected losses. In developing these probabilities of default, JPMorgan Chase Bank, N.A. considers the relationship between the credit quality characteristics of the underlying loans and certain assumptions about home prices and unemployment, based upon industry-wide data. JPMorgan Chase Bank, N.A. also considers its own historical loss experience to-date based on actual redefaulted modified loans. For credit card loans modified in TDRs, expected losses incorporate projected redefaults based on JPMorgan Chase Bank, N.A.'s historical experience by type of modification program. For wholesale loans modified in TDRs, expected losses incorporate management's expectation of the borrower's ability to repay under the modified terms.

Estimating the timing and amounts of future cash flows is highly judgmental as these cash flow projections rely upon estimates such as loss severities, asset valuations, default rates (including redefault rates on modified loans), the amounts and timing of interest or principal payments (including any expected prepayments) or other factors that are reflective of current and expected market conditions. These estimates are, in turn, dependent on factors such as the duration of current overall economic conditions, industry-, portfolio-, or borrower-specific factors, the expected outcome of insolvency proceedings as well as, in certain circumstances, other economic factors, including the level of future home prices. All of these estimates and assumptions require significant management judgment and certain assumptions are highly subjective.

PCI loans

In connection with the acquisition of certain PCI loans, which are accounted for as described in Note 13, the allowance for loan losses for the PCI portfolio is based on quarterly estimates of the amount of principal and interest cash flows expected to be collected over the estimated remaining lives of the loans.

These cash flow projections are based on estimates regarding default rates (including redefault rates on modified loans), loss severities, the amounts and timing of prepayments and other factors that are reflective of current and expected future market conditions. These estimates are dependent on assumptions regarding the level of future home prices, and the duration of current overall economic conditions, among other factors. These estimates and assumptions require significant management judgment and certain assumptions are highly subjective.

Allowance for credit losses and related information

The table below summarizes information about the allowances for loan losses and lending-relating commitments, and includes a breakdown of loans and lending-related commitments by impairment methodology.

	2017			
Year ended December 31, (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total
Allowance for loan losses				
Beginning balance at January 1,	$ 5,195	$ 1,042	$ 4,478	$ 10,715
Gross charge-offs	1,779	1,250	213	3,242
Gross recoveries	(634)	(110)	(93)	(837)
Net charge-offs	1,145	1,140	120	2,405
Write-offs of PCI loans[(a)]	86	–	–	86
Provision for loan losses	613	1,519	(277)	1,855
Other	–	–	2	2
Ending balance at December 31,	$ 4,577	$ 1,421	$ 4,083	$ 10,081
Allowance for loan losses by impairment methodology				
Asset-specific[(b)]	$ 246	$ 99 (c)	$ 430	$ 775
Formula-based	2,106	1,322	3,653	7,081
PCI	2,225	–	–	2,225
Total allowance for loan losses	$ 4,577	$ 1,421	$ 4,083	$ 10,081
Loans by impairment methodology				
Asset-specific	$ 8,029	$ 313	$ 1,808	$ 10,150
Formula-based	333,912	40,598	405,115	779,625
PCI	30,576	–	3	30,579
Total retained loans	$ 372,517	$ 40,911	$ 406,926	$ 820,354
Impaired collateral-dependent loans				
Net charge-offs	$ 65	$ –	$ 31	$ 96
Loans measured at fair value of collateral less cost to sell	2,131	–	233	2,364
Allowance for lending-related commitments				
Beginning balance at January 1,	$ 26	$ –	$ 1,052	$ 1,078
Provision for lending-related commitments	7	–	(17)	(10)
Other	–	–	–	–
Ending balance at December 31,	$ 33	$ –	$ 1,035	$ 1,068
Allowance for lending-related commitments by impairment methodology				
Asset-specific	$ –	$ –	$ 187	$ 187
Formula-based	33	–	848	881
Total allowance for lending-related commitments	$ 33	$ –	$ 1,035	$ 1,068
Lending-related commitments by impairment methodology				
Asset-specific	$ –	$ –	$ 731	$ 731
Formula-based	48,553	12,127	368,528	429,208
Total lending-related commitments	$ 48,553	$ 12,127	$ 369,259	$ 429,939

(a) Write-offs of PCI loans are recorded against the allowance for loan losses when actual losses for a pool exceed estimated losses that were recorded as purchase accounting adjustments at the time of acquisition. A write-off of a PCI loan is recognized when the underlying loan is removed from a pool.
(b) Includes risk-rated loans that have been placed on nonaccrual status and loans that have been modified in a TDR.
(c) The asset-specific credit card allowance for loan losses is related to loans that have been modified in a TDR; such allowance is calculated based on the loans' original contractual interest rates and does not consider any incremental penalty rates.
(d) The prior period amounts have been revised to conform to current period presentation.

(table continued from previous page)

2016				2015			
Consumer, excluding credit card	Credit card	Wholesale	Total	Consumer, excluding credit card	Credit card	Wholesale	Total
$ 5,803	$ 727	$ 4,277	$ 10,807	$ 6,969	$ 735	$ 3,648	$ 11,352
1,502	967	398	2,867	1,640	752	88	2,480
(588)	(91)	(56)	(735)	(674)	(79)	(106)	(859)
914	876	342	2,132	966	673	(18)	1,621
156	–	–	156	208	–	–	208
471	1,191	541	2,203	(64)	670	604	1,210
(9)	–	2	(7)	72	(5)	7	74
$ 5,195	$ 1,042	$ 4,478	$ 10,715	$ 5,803	$ 727	$ 4,277	$ 10,807
$ 308	$ 83 (c)	$ 342	$ 733	$ 364	$ 91 (c)	$ 273	$ 728
2,576	959	4,136	7,671	2,697	636	4,004	7,337
2,311	–	–	2,311	2,742	–	–	2,742
$ 5,195	$ 1,042	$ 4,478	$ 10,715	$ 5,803	$ 727	$ 4,277	$ 10,807
$ 8,930	$ 285	$ 2,017	$ 11,232	$ 9,595	$ 288	$ 1,015	$ 10,898
319,751	35,488	385,112	740,351	293,707	30,701	355,012	679,420
35,679	–	3	35,682	40,998	–	4	41,002
$ 364,360	$ 35,773	$ 387,132	$ 787,265	$ 344,300	$ 30,989	$ 356,031	$ 731,320
$ 97	$ –	$ 7	$ 104	$ 104	$ –	$ 16	$ 120
2,390	–	300	2,690	2,564	–	283	2,847
$ 14	$ –	$ 772	$ 786	$ 13	$ –	$ 606	$ 619
–	–	283	283	1	–	165	166
12	–	(3)	9	–	–	1	1
$ 26	$ –	$ 1,052	$ 1,078	$ 14	$ –	$ 772	$ 786
$ –	$ –	$ 169	$ 169	$ –	$ –	$ 73	$ 73
26	–	883	909	14	–	699	713
$ 26	$ –	$ 1,052	$ 1,078	$ 14	$ –	$ 772	$ 786
$ –	$ –	$ 506	$ 506	$ –	$ –	$ 193	$ 193
53,461 (d)	11,198	363,455	428,114 (d)	57,027 (d)	10,386	360,589	428,002 (d)
$ 53,461 (d)	$ 11,198	$ 363,961	$ 428,620 (d)	$ 57,027 (d)	$ 10,386	$ 360,782	$ 428,195 (d)

Note 15 – Variable interest entities

For a further description of JPMorgan Chase Bank, N.A.'s accounting policies regarding consolidation of VIEs, see Note 1.

The following table summarizes the most significant types of JPMorgan Chase Bank, N.A.-sponsored VIEs by each JPMorgan Chase Bank, N.A. business. JPMorgan Chase Bank, N.A. considers a "sponsored" VIE to include any entity where: (1) JPMorgan Chase Bank, N.A. is the primary beneficiary of the structure; (2) the VIE is used by JPMorgan Chase Bank, N.A. to securitize JPMorgan Chase Bank, N.A. assets; (3) the VIE issues financial instruments with the JPMorgan Chase Bank, N.A. name; or (4) the entity is a JPMorgan Chase Bank, N.A.–administered asset-backed commercial paper conduit.

JPMorgan Chase Bank, N.A. business	*Transaction Type*	*Activity*	*Consolidated Financial Statements page reference*
Consumer & community banking	Mortgage securitization trusts	Servicing and securitization of both originated and purchased residential mortgages	100-102
Corporate & investment banking	Mortgage and other securitization trusts	Securitization of both originated and purchased residential and commercial mortgages and other consumer loans	100-102
	Multi-seller conduits	Assist clients in accessing the financial markets in a cost-efficient manner and structures transactions to meet investor needs	102-103
	Municipal bond vehicles	Financing municipal bond investments	103

JPMorgan Chase Bank, N.A.'s other businesses are also involved with VIEs (both third-party and JPMorgan Chase Bank, N.A.-sponsored), but to a lesser extent, as follows:

- Commercial banking business: The commercial banking business provides financing and lending-related services to a wide spectrum of clients, including certain third party-sponsored entities that may meet the definition of a VIE. The commercial banking business does not control the activities of these entities and does not consolidate these entities. The commercial banking business' maximum loss exposure, regardless of whether the entity is a VIE, is generally limited to loans and lending-related commitments which are reported and disclosed in the same manner as any other third-party transaction.
- Corporate function: The corporate function is involved with entities that may meet the definition of VIEs; however these entities are generally subject to specialized investment company accounting, which does not require the consolidation of investments, including VIEs. In addition, the corporate function invests in securities generally issued by third parties which may meet the definition of VIEs (e.g., issuers of asset-backed securities). In general, JPMorgan Chase Bank, N.A. does not have the power to direct the significant activities of these entities and therefore does not consolidate these entities. See Note 11 for further information on JPMorgan Chase Bank, N.A.'s investment securities portfolio.

In addition, the corporate & investment banking business also invests in and provides financing and other services to VIEs sponsored by third parties. See page 105 of this Note for more information on the VIEs sponsored by third parties.

Significant JPMorgan Chase Bank, N.A.-sponsored variable interest entities

Mortgage and other securitization trusts

JPMorgan Chase Bank, N.A. securitizes (or has securitized) originated and purchased residential mortgages, commercial mortgages and other consumer loans primarily in its consumer & community banking and corporate & investment banking businesses. Depending on the particular transaction, as well as the respective business involved, JPMorgan Chase Bank, N.A. may act as the servicer of the loans and/or retain certain beneficial interests in the securitization trusts.

The following table presents the total unpaid principal amount of assets held in JPMorgan Chase Bank, N.A.-sponsored private-label securitization entities, including those in which JPMorgan Chase Bank, N.A. has continuing involvement, and those that are consolidated by JPMorgan Chase Bank, N.A. Continuing involvement includes servicing the loans, holding senior interests or subordinated interests (including amounts required to be held pursuant to credit risk retention rules), recourse or guarantee arrangements, and derivative transactions. In certain instances, JPMorgan Chase Bank, N.A.'s only continuing involvement is servicing the loans. See Securitization activity on page 106 of this Note for further information regarding JPMorgan Chase Bank, N.A.'s cash flows with and interests retained in nonconsolidated VIEs, and pages 106-107 of this Note for information on JPMorgan Chase Bank, N.A.'s loan sales to U.S. government agencies.

	Principal amount outstanding			JPMorgan Chase Bank, N.A. interest in securitized assets in nonconsolidated VIEs[(c)(d)]			
December 31, 2017 (in millions)	Total assets held by securitization VIEs	Assets held in consolidated securitization VIEs	Assets held in nonconsolidated securitization VIEs with continuing involvement	Trading assets	Securities	Other financial assets	Total interests held by JPMorgan Chase Bank, N.A.
Securitization-related[(a)]							
Residential mortgage:							
Prime/Alt-A and option ARMs	**$ 48,599**	**$ 3,615**	**$ 39,370**	**$ 215**	**$ 845**	**$ —**	**$ 1,060**
Subprime	**12,716**	**—**	**11,978**	**—**	**—**	**—**	**—**
Commercial and other[(b)]	**92,278**	**63**	**23,604**	**61**	**1,042**	**157**	**1,260**
Total	**$ 153,593**	**$ 3,678**	**$ 74,952**	**$ 276**	**$ 1,887**	**$ 157**	**$ 2,320**

	Principal amount outstanding			JPMorgan Chase Bank, N.A. interest in securitized assets in nonconsolidated VIEs[(c)(d)]			
December 31, 2016 (in millions)	Total assets held by securitization VIEs	Assets held in consolidated securitization VIEs	Assets held in nonconsolidated securitization VIEs with continuing involvement	Trading assets	Securities	Other financial assets	Total interests held by JPMorgan Chase Bank, N.A.
Securitization-related[(a)]							
Residential mortgage:							
Prime/Alt-A and option ARMs	$ 52,258	$ 4,209	$ 42,881 (e)	$ 124	$ 1,203	$ —	$ 1,327
Subprime	14,260	—	13,421	—	—	—	—
Commercial and other[(b)]	91,084	107	22,989 (e)	3	1,712	—	1,715
Total	$ 157,602	$ 4,316	$ 79,291 (e)	$ 127	$ 2,915	$ —	$ 3,042

(a) Excludes U.S. government agency securitizations. See pages 106-107 of this Note for information on JPMorgan Chase Bank, N.A.'s loan sales to U.S. government agencies.
(b) Consists of securities backed by commercial loans (predominantly real estate) and non-mortgage-related consumer receivables purchased from third parties.
(c) Excludes the following: retained servicing (see Note 16 for a discussion of MSRs); securities retained from loan sales to U.S. government agencies; interest rate and foreign exchange derivatives primarily used to manage interest rate and foreign exchange risks of securitization entities (See Note 6 for further information on derivatives). There were no senior and subordinated securities purchased in connection with the corporate & investment banking business's secondary market-making activities at December 31, 2017 and 2016, respectively.
(d) As of December 31, 2017 and 2016, 67% and 88%, respectively, of JPMorgan Chase Bank, N.A.'s retained securitization interests, which are predominantly carried at fair value and include amounts required to be held pursuant to credit risk retention rules, were risk-rated "A" or better, on an S&P-equivalent basis. The retained interests in prime residential mortgages consisted of $1.0 billion and $1.3 billion of investment-grade and $23 million and $44 million of noninvestment-grade retained interests at December 31, 2017 and 2016, respectively. The retained interests in commercial and other securitizations trusts consisted of $1.0 billion and $1.7 billion of investment-grade and $212 million and zero of noninvestment-grade retained interests at December 31, 2017 and 2016, respectively.
(e) Prior period results were revised to conform with the current period presentation.

Residential mortgage

JPMorgan Chase Bank, N.A. securitizes residential mortgage loans originated by the consumer & community banking business, as well as residential mortgage loans purchased from third parties by either the consumer & community banking business or the corporate & investment banking business. The consumer & community banking business generally retains servicing for all residential mortgage loans it originated or purchased, and for certain mortgage loans purchased by the corporate & investment banking business. For securitizations of loans serviced by the consumer & community banking business, JPMorgan Chase Bank, N.A. has the power to direct the significant activities of the VIE because it is responsible for decisions related to loan modifications and workouts. The consumer & community banking business may also retain an interest upon securitization.

In addition, the corporate & investment banking business engages in underwriting and trading activities involving securities issued by JPMorgan Chase Bank, N.A.-sponsored securitization trusts. As a result, the corporate & investment banking business at times retains senior and/or subordinated interests (including residual interests and amounts required to be held pursuant to credit risk retention rules) in residential mortgage securitizations at the time of 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 by the corporate & investment banking business or held by the consumer & community banking business, when considered together with the servicing arrangements entered into by the consumer & community banking business, JPMorgan Chase Bank, N.A. is deemed to be the primary beneficiary of certain securitization trusts. See the table on page 104 of this Note for more information on consolidated residential mortgage securitizations.

JPMorgan Chase Bank, N.A. does not consolidate a residential mortgage securitization (JPMorgan Chase Bank, N.A.-sponsored or third-party-sponsored) when it is not the servicer (and therefore does not have the power to direct the most significant activities of the trust) or does not hold a beneficial interest in the trust that could potentially be significant to the trust. See the table on page 104 of this Note for more information on the consolidated residential mortgage securitizations, and the table on the previous page of this Note for further information on interests held in nonconsolidated residential mortgage securitizations.

Commercial mortgages and other consumer securitizations

The corporate & investment banking business originates and securitizes commercial mortgage loans, and engages in underwriting and trading activities involving the securities issued by securitization trusts. The corporate & investment banking business may retain unsold senior and/or subordinated interests (including amounts required to be held pursuant to credit risk retention rules) in commercial mortgage securitizations at the time of securitization but, generally, JPMorgan Chase Bank, N.A. does not service commercial loan securitizations. For commercial mortgage securitizations the power to direct the significant activities of the VIE generally is held by the servicer or investors in a specified class of securities ("controlling class"). JPMorgan Chase Bank, N.A. generally does not retain an interest in the controlling class in its sponsored commercial mortgage securitization transactions. See the table on page 104 of this Note for more information on the consolidated commercial mortgage securitizations, and the table on the previous page of this Note for further information on interests held in nonconsolidated securitizations.

Multi-seller conduits

Multi-seller conduit entities are separate bankruptcy remote entities that provide secured financing, collateralized by pools of receivables and other financial assets, to customers of JPMorgan Chase Bank, N.A. The conduits fund their financing facilities through the issuance of highly rated commercial paper. The primary source of repayment of the commercial paper is the cash flows from the pools of assets. In most instances, the assets are structured with deal-specific credit enhancements provided to the conduits by the customers (i.e., sellers) or other third parties. Deal-specific credit enhancements are generally structured to cover a multiple of historical losses expected on the pool of assets, and are typically in the form of overcollateralization provided by the seller. The deal-specific credit enhancements mitigate JPMorgan Chase Bank, N.A.'s potential losses on its agreements with the conduits.

To ensure timely repayment of the commercial paper, and to provide the conduits with funding to provide financing to customers in the event that the conduits do not obtain funding in the commercial paper market, each asset pool financed by the conduits has a minimum 100% deal-specific liquidity facility associated with it provided by JPMorgan Chase Bank, N.A. JPMorgan Chase Bank, N.A. also provides the multi-seller conduit vehicles with uncommitted program-wide liquidity facilities and program-wide credit enhancement in the form of standby letters of credit. The amount of program-wide credit enhancement required is based upon commercial paper issuance and approximates 10% of the outstanding balance of commercial paper.

JPMorgan Chase Bank, N.A. consolidates its JPMorgan Chase Bank, N.A.-administered multi-seller conduits, as it has both the power to direct the significant activities of the conduits and a potentially significant economic interest in the conduits. As administrative agent and in its role in structuring transactions, JPMorgan Chase Bank, N.A. makes decisions regarding asset types and credit quality, and manages the commercial paper funding needs of the conduits. JPMorgan Chase Bank, N.A.'s interests that could potentially be significant to the VIEs include the fees received as administrative agent and liquidity and program-wide credit enhancement provider, as well as the potential exposure created by the liquidity and credit enhancement facilities provided to the conduits. See page 104 of this Note for further information on consolidated VIE assets and liabilities.

In the normal course of business, JPMorgan Chase Bank, N.A. makes markets in and invests in commercial paper issued by JPMorgan Chase Bank, N.A.-administered multi-seller conduits. JPMorgan Chase Bank, N.A. held $20.4 billion and $21.2 billion of the commercial paper issued by JPMorgan Chase Bank, N.A.-administered multi-seller conduits at December 31, 2017 and 2016, respectively, which have been eliminated in consolidation. JPMorgan Chase Bank, N.A.'s investments reflect its funding needs and capacity and were not driven by market illiquidity. Other than the amounts required to be held pursuant to credit risk retention rules, JPMorgan Chase Bank, N.A. is not obligated under any agreement to purchase the commercial paper issued by JPMorgan Chase Bank, N.A.-administered multi-seller conduits.

JPMorgan Chase Bank, N.A. provides deal-specific liquidity as well as program-wide liquidity and credit enhancement to its administered multi-seller conduits, which have been eliminated in consolidation. The administered multi-seller conduits then provide certain of their clients with lending-related commitments. The unfunded commitments were $8.8 billion and $7.4 billion at December 31, 2017 and 2016, respectively, and are reported as off-balance sheet lending-related commitments. For more information on off-balance sheet lending-related commitments, see Note 25.

Municipal bond vehicles

Municipal bond vehicles or tender option bond ("TOB") trusts allow institutions 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 JPMorgan Chase Bank, N.A. Customer TOB trusts are sponsored by a third party; see page 105 on this Note for further information. JPMorgan Chase Bank, N.A. serves as sponsor for all Non-Customer TOB transactions. JPMorgan Chase Bank, N.A. may provide various services to a TOB trust, including liquidity or tender option provider, and/or sponsor.

JPMorgan Chase Bank, N.A. 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 TOB trust's purchase of the Floaters, or it directly purchases the tendered Floaters.

TOB trusts are considered to be variable interest entities. JPMorgan Chase Bank, N.A. consolidates Non-Customer TOB trusts because as the Residual holder, JPMorgan Chase Bank, N.A. has the right to make decisions that significantly impact the economic performance of the municipal bond vehicle, and it has the right to receive benefits and bear losses that could potentially be significant to the municipal bond vehicle. See page 104 of this Note for further information on consolidated municipal bond vehicles.

Consolidated VIE assets and liabilities

The following table presents information on assets and liabilities related to VIEs consolidated by JPMorgan Chase Bank, N.A. as of December 31, 2017 and 2016.

	Assets				Liabilities		
December 31, 2017 (in millions)	Trading assets	Loans	Other[d]	Total assets[e]	Beneficial interests in VIE assets[f]	Other[g]	Total liabilities
VIE program type[a]							
JPMorgan Chase Bank, N.A.-administered multi-seller conduits	**$ —**	**$ 23,411**	**$ 48**	**$ 23,459**	**$ 3,045**	**$ 53**	**$ 3,098**
Municipal bond vehicles	**1,278**	**—**	**3**	**1,281**	**1,360**	**2**	**1,362**
Mortgage securitization entities[b]	**—**	**3,661**	**55**	**3,716**	**314**	**199**	**513**
Student loan securitization entities[c]	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Other	**102**	**—**	**1,592**	**1,694**	**134**	**—**	**134**
Total	**$ 1,380**	**$ 27,072**	**$ 1,698**	**$ 30,150**	**$ 4,853**	**$ 254**	**$ 5,107**

	Assets				Liabilities		
December 31, 2016 (in millions)	Trading assets	Loans	Other[d]	Total assets[e]	Beneficial interests in VIE assets[f]	Other[g]	Total liabilities
VIE program type[a]							
JPMorgan Chase Bank, N.A.-administered multi-seller conduits	$ —	$ 23,760	$ 43	$ 23,803	$ 2,719	$ 56	$ 2,775
Municipal bond vehicles	2,540	—	5	2,545	2,673	2	2,675
Mortgage securitization entities[b]	—	4,246	103	4,349	355	313	668
Student loan securitization entities[c]	—	1,689	59	1,748	1,527	4	1,531
Other	115	—	1,940	2,055	177	2	179
Total	$ 2,655	$ 29,695	$ 2,150	$ 34,500	$ 7,451	$ 377	$ 7,828

(a) Excludes intercompany transactions, which are eliminated in consolidation.
(b) Includes residential and commercial mortgage securitizations.
(c) JPMorgan Chase Bank, N.A. deconsolidated the student loan securitization entities in the first half of 2017 as it no longer had a controlling financial interest in these entities as a result of the sale of the student loan portfolio.
(d) Includes assets classified as cash and other assets on the Consolidated balance sheets.
(e) The assets of the consolidated VIEs included in the program types above are used to settle the liabilities of those entities. The difference between total assets and total liabilities recognized for consolidated VIEs represents JPMorgan Chase Bank, N.A.'s interest in the consolidated VIEs for each program type.
(f) The interest-bearing beneficial interest liabilities issued by consolidated VIEs are classified in the line item on the Consolidated balance sheets titled, "Beneficial interests issued by consolidated variable interest entities." The holders of these beneficial interests do not have recourse to the general credit of JPMorgan Chase Bank, N.A. Included in beneficial interests in VIE assets are long-term beneficial interests of $447 million and $2.1 billion at December 31, 2017 and 2016, respectively. For additional information on interest bearing long-term beneficial interest, see Note 19.
(g) Includes liabilities classified as accounts payable and other liabilities on the Consolidated balance sheets.

VIEs sponsored by third parties

JPMorgan Chase Bank, N.A. enters into transactions with VIEs structured by other parties. These include, for example, acting as a derivative counterparty, liquidity provider, investor, underwriter, placement agent, remarketing agent, trustee or custodian. These transactions are conducted at arm's-length, and individual credit decisions are based on the analysis of the specific VIE, taking into consideration the quality of the underlying assets. Where JPMorgan Chase Bank, N.A. does not have the power to direct the activities of the VIE that most significantly impact the VIE's economic performance, or a variable interest that could potentially be significant, JPMorgan Chase Bank, N.A. generally does not consolidate the VIE, but it records and reports these positions on its Consolidated balance sheets in the same manner it would record and report positions in respect of any other third-party transaction.

Tax credit vehicles

JPMorgan Chase Bank, N.A. holds investments in unconsolidated tax credit vehicles, which are limited partnerships and similar entities that construct, own and operate affordable housing and wind projects. These entities are primarily considered VIEs. A third party is typically the general partner or managing member and has control over the significant activities of the tax credit vehicles, and accordingly JPMorgan Chase Bank, N.A. does not consolidate tax credit vehicles. JPMorgan Chase Bank, N.A. generally invests in these partnerships as a limited partner and earns a return primarily through the receipt of tax credits allocated to the projects. The maximum loss exposure, represented by equity investments and funding commitments, was $7.8 billion and $8.6 billion, of which $2.4 billion and $2.7 billion was unfunded at December 31, 2017 and 2016 respectively. In order to reduce the risk of loss, JPMorgan Chase Bank, N.A. assesses each project and withholds varying amounts of its capital investment until qualification of the project for tax credits. See Note 22 for further information on affordable housing tax credits. For more information on off-balance sheet lending-related commitments, see Note 25.

Customer municipal bond vehicles (TOB trusts)

JPMorgan Chase Bank, N.A. may provide various services to Customer TOB trusts, including remarketing agent, liquidity or tender option provider. In certain Customer TOB transactions, JPMorgan Chase Bank, N.A. as liquidity provider, has entered into a reimbursement agreement with the Residual holder. In those transactions, upon the termination of the vehicle, JPMorgan Chase Bank, N.A. has recourse to the third party Residual holders for any shortfall. JPMorgan Chase Bank, N.A. does not have any intent to protect Residual holders from potential losses on any of the underlying municipal bonds. JPMorgan Chase Bank, N.A. does not consolidate Customer TOB trusts, since JPMorgan Chase Bank, N.A. does not have the power to make decisions that significantly impact the economic performance of the municipal bond vehicle. JPMorgan Chase Bank, N.A. maximum exposure as a liquidity provider to Customer TOB trusts at December 31, 2017 and 2016, was $5.3 billion and $5.0 billion, respectively. The fair value of assets held by such VIEs at December 31, 2017 and 2016 was $9.0 billion and 8.6 billion, respectively. For more information on off-balance sheet lending-related commitments, see Note 25.

Loan securitizations

JPMorgan Chase Bank, N.A. has securitized and sold a variety of loans, including residential mortgage, credit card, student and commercial (primarily related to real estate) loans, as well as debt securities. The purposes of these securitization transactions were to satisfy investor demand and to generate liquidity for JPMorgan Chase Bank, N.A.

For loan securitizations in which JPMorgan Chase Bank, N.A. is not required to consolidate the trust, JPMorgan Chase Bank, N.A. records the transfer of the loan receivable to the trust as a sale when all of the following accounting criteria for a sale are met: (1) the transferred financial assets are legally isolated from JPMorgan Chase Bank, N.A.'s creditors; (2) the transferee or beneficial interest holder can pledge or exchange the transferred financial assets; and (3) JPMorgan Chase Bank, N.A. does not maintain effective control over the transferred financial assets (e.g., JPMorgan Chase Bank, N.A. cannot repurchase the transferred assets before their maturity and it does not have the ability to unilaterally cause the holder to return the transferred assets).

For loan securitizations accounted for as a sale, JPMorgan Chase Bank, N.A. recognizes a gain or loss based on the difference between the value of proceeds received (including cash, beneficial interests, or servicing assets received) and the carrying value of the assets sold. Gains and losses on securitizations are reported in noninterest revenue.

Securitization activity

The following table provides information related to JPMorgan Chase Bank, N.A.'s securitization activities for the years ended December 31, 2017, 2016 and 2015, related to assets held in JPMorgan Chase Bank, N.A.-sponsored securitization entities that were not consolidated by JPMorgan Chase Bank, N.A., and where sale accounting was achieved at the time of the securitization.

	2017			2016			2015		
Year ended December 31, (in millions, except rates)	Credit card(b)	Residential mortgage(c)	Commercial and other(d)	Credit card(b)	Residential mortgage(c)	Commercial and other(d)	Credit card(b)	Residential mortgage(c)	Commercial and other(d)
Principal securitized	**$ –**	**$ 5,532**	**$ 10,252**	$ 3,320	$ 1,817	$ 8,964	$ 3,330	$ 3,008	$ 11,983
Pretax gain/(loss)	**–**	**–** (e)	**–** (e)	(1)	– (e)	– (e)	(2)	– (e)	– (e)
All cash flows during the period:									
Proceeds received from loan sales as cash	**$ –**	**$ 5,627**	**$ 10,123**	$ 3,320	$ 1,760	$ 9,094	$ 3,330	$ 2,077	$ 11,661
Proceeds received from loan sales as securities or other financial assets	**–**	**34**	**214**	–	71	–	–	945	350
Total proceeds received from loan sales	**$ –**	**$ 5,661**	**$ 10,337**	$ 3,320	$ 1,831	$ 9,094	$ 3,330	$ 3,022	$ 12,011
Servicing fees collected	**–**	**525**	**2**	–	477	3	–	528	3
Proceeds from collections reinvested in revolving securitizations	**–**	**–**	**–**	38,991	–	–	44,734	–	–
Purchases of previously transferred financial assets (or the underlying collateral)(a)	**–**	**1**	**–**	–	37	–	–	2	–
Cash flows received on interests	**–**	**383**	**632**	9,317	408	830	15,309	321	533

(a) Includes cash paid by JPMorgan Chase Bank, N.A. to reacquire assets from off-balance sheet, nonconsolidated entities – for example, loan repurchases due to representation and warranties and servicer clean-up calls.
(b) For the years ended December 31, 2016 and 2015, includes securitization activity related to JPMorgan Chase Bank, N.A.'s undivided interest in credit card securitization trusts. On November 1, 2016, JPMorgan Chase Bank, N.A. sold its undivided interests in the Trusts to an affiliate.
(c) Includes prime/Alt-A, subprime, and option ARMs. Excludes certain loan securitization transactions entered into with Ginnie Mae, Fannie Mae and Freddie Mac.
(d) Includes commercial mortgage and other consumer loans.
(e) JPMorgan Chase Bank, N.A. elected the fair value option for loans pending securitization. The carrying value of these loans accounted for at fair value approximated the proceeds received from securitization.

Key assumptions used to value retained interests originated during the year are shown in the table below.

Year ended December 31,	2017	2016	2015
Residential mortgage retained interest:			
Weighted-average life (in years)	**3.8**	4.1	–
Weighted-average discount rate	**3.0%**	2.9%	–%
Commercial mortgage retained interest:			
Weighted-average life (in years)	**5.3**	–	–
Weighted-average discount rate	**4.7%**	–%	–%

Loans and excess MSRs sold to U.S. government-sponsored enterprises, loans in securitization transactions pursuant to Ginnie Mae guidelines, and other third-party-sponsored securitization entities

In addition to the amounts reported in the securitization activity tables above, JPMorgan Chase Bank, N.A., in the normal course of business, sells originated and purchased mortgage loans and certain originated excess MSRs on a nonrecourse basis, predominantly to U.S. government sponsored enterprises ("U.S. GSEs"). These loans and excess MSRs are sold primarily for the purpose of securitization by the U.S. GSEs, who provide certain guarantee provisions (e.g., credit enhancement of the loans). JPMorgan Chase Bank, N.A.also sells loans into securitization transactions pursuant to Ginnie Mae guidelines; these loans are typically insured or guaranteed by another U.S. government agency. JPMorgan Chase Bank, N.A. does not consolidate the securitization vehicles underlying these transactions as it is not the primary beneficiary. For a limited number of loan sales, JPMorgan Chase Bank, N.A. is obligated to share a portion of the credit risk associated with the sold loans with the purchaser. See Note 25 for additional information about JPMorgan Chase Bank, N.A.'s loan sales- and securitization-related indemnifications.

See Note 16 for additional information about the impact of JPMorgan Chase Bank, N.A.'s sale of certain excess MSRs.

The following table summarizes the activities related to loans sold to the U.S. GSEs, loans in securitization transactions pursuant to Ginnie Mae guidelines, and other third-party-sponsored securitization entities.

Year ended December 31, (in millions)	2017	2016	2015
Carrying value of loans sold	**$ 64,542**	$ 52,869	$ 42,161
Proceeds received from loan sales as cash	**$ 117**	$ 592	$ 313
Proceeds from loans sales as securities[(a)]	**63,542**	51,852	41,615
Total proceeds received from loan sales[(b)]	**$ 63,659**	$ 52,444	$ 41,928
Gains on loan sales[(c)(d)]	**$ 163**	$ 222	$ 299

(a) Predominantly includes securities from U.S. GSEs and Ginnie Mae that are generally sold shortly after receipt.
(b) Excludes the value of MSRs retained upon the sale of loans.
(c) Gains on loan sales include the value of MSRs.
(d) The carrying value of the loans accounted for at fair value approximated the proceeds received upon loan sale.

Options to repurchase delinquent loans

In addition to JPMorgan Chase Bank, N.A.'s obligation to repurchase certain loans due to material breaches of representations and warranties as discussed in Note 25. JPMorgan Chase Bank, N.A. also has the option to repurchase delinquent loans that it services for Ginnie Mae loan pools, as well as for other U.S. government agencies under certain arrangements. JPMorgan Chase Bank, N.A. typically elects to repurchase delinquent loans from Ginnie Mae loan pools as it continues to service them and/or manage the foreclosure process in accordance with the applicable requirements, and such loans continue to be insured or guaranteed. When JPMorgan Chase Bank, N.A.'s repurchase option becomes exercisable, such loans must be reported on the Consolidated balance sheets as a loan with a corresponding liability.

December 31, (in millions)	2017	2016
Loans repurchased or option to repurchase[(a)]	**$ 8,617**	$ 9,543
Real estate owned	**95**	142
Foreclosed government-guaranteed residential mortgage loans[(b)]	**527**	1,007

(a) Predominantly all of these amounts relate to loans that have been repurchased from Ginnie Mae loan pools.
(b) Relates to voluntary repurchases of loans, which are included in accrued interest and accounts receivable.

Loan delinquencies and liquidation losses

The table below includes information about components of nonconsolidated securitized financial assets held in JPMorgan Chase Bank, N.A.-sponsored private-label securitization entities, in which JPMorgan Chase Bank, N.A. has continuing involvement, and delinquencies as of December 31, 2017 and 2016.

	Securitized assets		90 days past due		Liquidation losses	
As of or for the year ended December 31, (in millions)	2017	2016	2017	2016	2017	2016
Securitized loans						
Residential mortgage:						
Prime/ Alt-A & option ARMs	**$ 39,370**	$ 42,881 [(a)]	**$ 3,178**	$ 4,026 [(a)]	**$ 479**	$ 677 [(a)]
Subprime	**11,978**	13,421	**2,070**	2,635	**418**	720 [(a)]
Commercial and other	**23,604**	22,989 [(a)]	**78**	653 [(a)]	**1**	372 [(a)]
Total loans securitized	**$ 74,952**	$ 79,291	**$ 5,326**	$ 7,314	**$ 898**	$ 1,769

(a) Prior period results were revised to conform with the current period presentation.

Note 16 – Goodwill and Mortgage servicing rights

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 during the fourth quarter of each fiscal year, or more often if events or circumstances, such as adverse changes in the business climate, indicate there may be impairment.

The following table presents changes in the carrying amount of goodwill.

Year ended December 31, (in millions)	2017	2016	2015
Balance at beginning of period[(a)]	**$ 27,130**	$ 27,100	$ 27,282
Changes during the period from:			
Business combinations[(b)]	**199**	–	28
Dispositions	**–**	–	(59)
Other[(c)]	**21**	30	(151)
Balance at December 31,[(a)]	**$ 27,350**	$ 27,130	$ 27,100

(a) Reflects gross goodwill balances as JPMorgan Chase Bank, N.A. has not recognized any impairment losses to date.
(b) For 2017, represents consumer & community banking business goodwill in connection with an acquisition.
(c) Includes foreign currency translation adjustments and other tax-related adjustments.

Impairment testing

Goodwill was not impaired at December 31, 2017, 2016 and 2015.

The goodwill impairment test is performed in two steps. In the first step, the current fair value of JPMorgan Chase Bank, N.A. is compared with its carrying value, including goodwill and other intangible assets. If the fair value is in excess of the carrying value, then the goodwill is considered to be not impaired. If the fair value is less than the carrying value, then a second step is performed. In the second step, the implied current fair value of the goodwill is determined by comparing the fair value of JPMorgan Chase Bank, N.A. (as determined in step one) to the fair value of the net assets of JPMorgan Chase Bank, N.A. as if it was being acquired in a business combination. The resulting implied current fair value of goodwill is then compared with the carrying value of JPMorgan Chase Bank, N.A.'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.

Declines in business performance, increases in credit losses, increases in capital requirements, as well as deterioration in economic or market conditions, estimates of adverse regulatory or legislative changes or increases in the estimated market cost of equity, could cause the estimated fair values of JPMorgan Chase Bank, N.A.'s, 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.

Mortgage servicing rights

MSRs represent the fair value of expected future cash flows for performing servicing activities for others. The fair value considers estimated future servicing fees and ancillary revenue, offset by estimated costs to service the loans, and generally declines over time as net servicing cash flows are received, effectively amortizing the MSR asset against contractual servicing and ancillary fee income. MSRs are either purchased from third parties or recognized upon sale or securitization of mortgage loans if servicing is retained.

As permitted by U.S. GAAP, JPMorgan Chase Bank, N.A. has elected to account for its MSRs at fair value. JPMorgan Chase Bank, N.A. treats its MSRs as a single class of servicing assets based on the availability of market inputs used to measure the fair value of its MSR asset and its treatment of MSRs as one aggregate pool for risk management purposes. JPMorgan Chase Bank, N.A. estimates the fair value of MSRs using an option-adjusted spread ("OAS") model, which projects MSR cash flows over multiple interest rate scenarios in conjunction with JPMorgan Chase Bank, N.A.'s prepayment model, and then discounts these cash flows at risk-adjusted rates. The model considers portfolio characteristics, contractually specified servicing fees, prepayment assumptions, delinquency rates, costs to service, late charges and other ancillary revenue, and other economic factors. JPMorgan Chase Bank, N.A. compares fair value estimates and assumptions to observable market data where available, and also considers recent market activity and actual portfolio experience.

The fair value of MSRs is sensitive to changes in interest rates, including their effect on prepayment speeds. MSRs typically decrease in value when interest rates decline because declining interest rates tend to increase prepayments and therefore reduce the expected life of the net servicing cash flows that comprise the MSR asset. Conversely, securities (e.g., mortgage-backed securities), principal-only certificates and certain derivatives (i.e., those for which JPMorgan Chase Bank, N.A. receives fixed-rate interest payments) increase in value when interest rates decline. JPMorgan Chase Bank, N.A. uses combinations of derivatives and securities to manage the risk of changes in the fair value of MSRs. The intent is to offset any interest-rate related changes in the fair value of MSRs with changes in the fair value of the related risk management instruments.

The following table summarizes MSR activity for the years ended December 31, 2017, 2016 and 2015.

As of or for the year ended December 31, (in millions, except where otherwise noted)	2017	2016	2015
Fair value at beginning of period	$ 6,096	$ 6,608	$ 7,436
MSR activity:			
Originations of MSRs	1,103	679	550
Purchase of MSRs	—	—	435
Disposition of MSRs[(a)]	(140)	(109)	(486)
Net additions	963	570	499
Changes due to collection/realization of expected cash flows	(797)	(919)	(922)
Changes in valuation due to inputs and assumptions:			
Changes due to market interest rates and other[(b)]	(202)	(72)	(160)
Changes in valuation due to other inputs and assumptions:			
Projected cash flows (e.g., cost to service)	(102)	(35)	(112)
Discount rates	(19)	7	(10)
Prepayment model changes and other[(c)]	91	(63)	(123)
Total changes in valuation due to other inputs and assumptions	(30)	(91)	(245)
Total changes in valuation due to inputs and assumptions	$ (232)	$ (163)	$ (405)
Fair value at December 31,	$ 6,030	$ 6,096	$ 6,608
Change in unrealized gains/(losses) included in income related to MSRs held at December 31,	$ (232)	$ (163)	$ (405)
Contractual service fees, late fees and other ancillary fees included in income	$ 1,886	$ 2,124	$ 2,533
Third-party mortgage loans serviced at December 31, (in billions)	$ 555.0	$ 593.3	$ 677.0
Servicer advances, net of an allowance for uncollectible amounts, at December 31, (in billions)[(d)]	$ 4.0	$ 4.7	$ 6.5

(a) Includes excess MSRs transferred to agency-sponsored trusts in exchange for stripped mortgage backed securities ("SMBS"). In each transaction, a portion of the SMBS was acquired by third parties at the transaction date; JPMorgan Chase Bank, N.A. acquired the remaining balance of those SMBS as trading securities.

(b) Represents both the impact of changes in estimated future prepayments due to changes in market interest rates, and the difference between actual and expected prepayments.

(c) Represents changes in prepayments other than those attributable to changes in market interest rates.

(d) Represents amounts JPMorgan Chase Bank, N.A. pays as the servicer (e.g., scheduled principal and interest, taxes and insurance), which will generally be reimbursed within a short period of time after the advance from future cash flows from the trust or the underlying loans. JPMorgan Chase Bank, N.A.'s credit risk associated with these servicer advances is minimal because reimbursement of the advances is typically senior to all cash payments to investors. In addition, JPMorgan Chase Bank, N.A. maintains the right to stop payment to investors if the collateral is insufficient to cover the advance. However, certain of these servicer advances may not be recoverable if they were not made in accordance with applicable rules and agreements.

The table below outlines the key economic assumptions used to determine the fair value of JPMorgan Chase Bank, N.A.'s MSRs at December 31, 2017 and 2016, and outlines the sensitivities of those fair values to immediate adverse changes in those assumptions, as defined below.

December 31, (in millions, except rates)	2017	2016
Weighted-average prepayment speed assumption ("CPR")	9.35%	9.41%
Impact on fair value of 10% adverse change	$ (221)	$ (231)
Impact on fair value of 20% adverse change	(427)	(445)
Weighted-average option adjusted spread	9.04%	8.55%
Impact on fair value of 100 basis points adverse change	$ (250)	$ (248)
Impact on fair value of 200 basis points adverse change	(481)	(477)

CPR: Constant prepayment rate.

Changes in fair value based on variation in assumptions generally cannot be easily extrapolated, because the relationship of the change in the assumptions to the change in fair value are often highly interrelated and may not be linear. In this table, the effect that a change in a particular assumption may have on the fair value is calculated without changing any other assumption. In reality, changes in one factor may result in changes in another, which would either magnify or counteract the impact of the initial change.

Note 17 – Premises and equipment

Premises and equipment, including leasehold improvements, are carried at cost less accumulated depreciation and amortization. JPMorgan Chase Bank, N.A. computes depreciation using the straight-line method over the estimated useful life of an asset. For leasehold improvements, JPMorgan Chase Bank, N.A. uses the straight-line method computed over the lesser of the remaining term of the leased facility or the estimated useful life of the leased asset.

JPMorgan Chase Bank, N.A. capitalizes certain costs associated with the acquisition or development of internal-use software. Once the software is ready for its intended use, these costs are amortized on a straight-line basis over the software's expected useful life and reviewed for impairment on an ongoing basis.

Note 18 – Deposits

At December 31, 2017 and 2016, noninterest-bearing and interest-bearing deposits were as follows.

December 31, (in millions)	2017	2016
U.S. offices		
Noninterest-bearing	**$ 397,080**	$ 405,536
Interest-bearing (included **$15,006** and $12,298 at fair value)[a]	**874,806**	830,735
Total deposits in U.S. offices	**1,271,886**	1,236,271
Non-U.S. offices		
Noninterest-bearing	**16,282**	15,072
Interest-bearing (included **$6,374** and $1,667 at fair value)[a]	**246,739**	228,895
Total deposits in non-U.S. offices	**263,021**	243,967
Total deposits	**$1,534,907**	$1,480,238

(a) Includes structured notes classified as deposits for which the fair value option has been elected. For further discussion, see Note 4.

At December 31, 2017 and 2016, time deposits in denominations of $250,000 or more were as follows.

December 31, (in millions)	2017	2016
U.S. offices	**$ 40,377**	$ 39,598
Non-U.S. offices[a]	**30,103**	31,678
Total[a]	**$ 70,480**	$ 71,276

(a) The prior period amounts have been revised to conform with the current period presentation.

At December 31, 2017, the maturities of interest-bearing time deposits were as follows.

December 31, 2017 (in millions)	U.S.	Non-U.S.	Total
2018	$ 36,926	$ 28,506	$ 65,432
2019	13,941	540	14,481
2020	2,341	22	2,363
2021	4,283	26	4,309
2022	2,305	443	2,748
After 5 years	3,395	1,697	5,092
Total	$ 63,191	$ 31,234	$ 94,425

Note 19 – Long-term debt

JPMorgan Chase Bank, N.A. issues long-term debt denominated in various currencies, predominantly U.S. dollars, with both fixed and variable interest rates. Included in senior and subordinated debt below are various equity-linked or other indexed instruments, which JPMorgan Chase Bank, N.A. has elected to measure at fair value. Changes in fair value are recorded in principal transactions revenue in the Consolidated statements of income, except for unrealized gains/(losses) due to DVA which are recorded in OCI. 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, 2017.

By remaining maturity at December 31, (in millions, except rates)		2017				2016
		Under 1 year	1-5 years	After 5 years	Total	Total
Long-term debt payable to JPMorgan Chase & Co. and affiliates						
Senior debt:	Variable rate	$ 381	$ 20,249	$ 91	$ 20,721	$ 21,380
	Interest rates[a]	–%	1.71%	–%	1.71%	0.91%
Subordinated debt:	Variable rate	$ –	$ –	$ –	$ –	$ 250
	Interest rates[a]	–%	–%	–%	–%	2.80%
	Subtotal	$ 381	$ 20,249	$ 91	$ 20,721	$ 21,630
Long-term debt issued to unrelated parties						
Federal Home Loan Banks ("FHLB") advances:	Fixed rate	$ 4	$ 34	$ 130	$ 168	$ 179
	Variable rate	10,450	24,800	11,000	46,250	58,040
	Interest rates[a]	1.58-1.75%	1.46-1.80%	1.18-1.47%	1.18-1.80%	0.41-1.13%
Senior debt:	Fixed rate	$ 1,053	$ 3,743	$ 6,676	$ 11,472	$ 7,877
	Variable rate	6,916	8,511	3,360	18,787	15,521
	Interest rates[a]	0.22-2.09%	1.65-2.26%	1.00-7.28%	0.22-7.28%	0.00-7.28%
Subordinated debt:	Fixed rate	$ –	$ –	$ 313	$ 313	$ 3,884
	Variable rate	–	–	–	–	–
	Interest rates[a]	–%	–%	8.25%	8.25%	6.00-8.25%
	Subtotal	$ 18,423	$ 37,088	$ 21,479	$ 76,990	$ 85,501
Total long-term debt[b][c][d]		$ 18,804	$ 57,337	$ 21,570	$ 97,711 [f][g]	$ 107,131
Long-term beneficial interests:						
	Fixed rate	$ 78	$ 14	$ –	$ 92	$ 107
	Variable rate	–	42	314	356	1,952
	Interest rates	2.5%	2.83-3.38%	1.98-3.75%	1.98-3.75%	1.07-3.75%
Total long-term beneficial interests[e]		$ 78	$ 56	$ 314	$ 448	$ 2,059

(a) The interest rates shown are the range of contractual rates in effect at December 31, 2017 and 2016, respectively, including non-U.S. dollar fixed- and variable-rate issuances, which excludes the effects of the associated derivative instruments used in hedge accounting relationships, if applicable. The use of these derivative instruments modifies JPMorgan Chase Bank, N.A.'s exposure to the contractual interest rates disclosed in the table above. Including the effects of the hedge accounting derivatives, the range of modified rates in effect at December 31, 2017, for total long-term debt was 0.22% to 7.28%, versus the contractual range of 0.22% to 8.25% presented in the table above. The interest rate ranges shown exclude structured notes accounted for at fair value.

(b) Included long-term debt of $49.3 billion and $60.4 billion secured by assets totaling $208.4 billion and $205.1 billion at December 31, 2017 and 2016, respectively. The amount of long-term debt secured by assets does not include amounts related to hybrid instruments.

(c) Included $21.4 billion and $14.9 billion of long-term debt accounted for at fair value at December 31, 2017 and 2016, respectively.

(d) Included $2.0 billion and $1.5 billion of outstanding zero-coupon notes at December 31, 2017 and 2016, respectively. The aggregate principal amount of these notes at their respective maturities is $4.0 billion and $2.9 billion, respectively. The aggregate principal amount reflects the contractual principal payment at maturity, which may exceed the contractual principal payment at JPMorgan Chase Bank, N.A.'s next call date, if applicable.

(e) Included on the Consolidated balance sheets in beneficial interests issued by consolidated VIEs. Excluded short-term commercial paper and other short-term beneficial interests of $4.4 billion and $5.4 billion at December 31, 2017 and 2016, respectively.

(f) At December 31, 2017, long-term debt in the aggregate of $38.6 billion was redeemable at the option of JPMorgan Chase Bank, N.A., in whole or in part, prior to maturity, based on the terms specified in the respective instruments.

(g) The aggregate carrying values of debt that matures in each of the five years subsequent to 2017 is $18.8 billion in 2018, $39.4 billion in 2019, $9.5 billion in 2020, $6.4 billion in 2021 and $2.0 billion in 2022.

The weighted-average contractual interest rates for total long-term debt excluding structured notes accounted for at fair value were 1.60% and 1.20% as of December 31, 2017 and 2016, respectively. In order to modify exposure to interest rate movements, JPMorgan Chase Bank, N.A. utilizes derivative instruments, primarily interest rate swaps, in conjunction with some of its debt issuances. The use of these instruments modifies JPMorgan Chase Bank, N.A.'s interest expense on the associated debt. The modified weighted-average interest rates for total long-term debt, including the effects of related derivative instruments, were 1.59% and 1.06% as of December 31, 2017 and 2016, respectively.

JPMorgan Chase Bank, N.A's unsecured debt does not contain requirements that would call for an acceleration of payments, maturities or changes in the structure of the existing debt, provide any limitations on future borrowings or require additional collateral, based on unfavorable changes in JPMorgan Chase Bank, N.A's credit ratings, financial ratios or earnings.

Note 20 – Related party transactions

JPMorgan Chase Bank, N.A. regularly enters into transactions with JPMorgan Chase and its various subsidiaries.

Significant revenue- and expense-related transactions with these related parties are listed below.

Year ended December 31, (in millions)	**2017**	2016	2015
Interest income	**$ 1,046**	$ 615	$ 150
Interest expense	**1,379**	656	298
Net interest expense	**(333)**	(41)	(148)
Noninterest revenue[a]			
Principal transactions	**1,871**	2,433	(3,637)
All other income	**6,125**	6,769	6,906
Total noninterest revenue	**7,996**	9,202	3,269
Noninterest expense	**5,806**	5,692	3,875
Total net revenue	**$ 1,857**	$ 3,469	$ (754)

Significant balances with these related parties are listed below.

December 31, (in millions)	**2017**	2016
Assets		
Deposits with banks[b]	**$ 51,001**	$ 32,500
Federal funds sold and securities purchased under resale agreements	**41,014**	72,097
Accrued interest and accounts receivable	**13,479**	11,936
All other assets	**11,990**	12,305
Liabilities		
Deposits[c]	**92,385**	107,749
Federal funds purchased and securities loaned or sold under repurchase agreements	**19,213**	14,501
Accounts payable and other liabilities	**11,826**	12,118
Long-term debt	**20,716**	21,630

(a) The prior period amounts have been revised to conform with the current presentation.
(b) Primarily includes deposits placed with Chase Bank USA, N.A.
(c) At both December 31, 2017 and 2016, included $20.0 billion that was pledged to support extensions of credit and other transactions requiring collateral with affiliates as defined by Section 23A under the Federal Reserve Act, which defines the constraints that apply to U.S. banks in certain of their interactions with affiliates.

Derivative transactions

In addition to the information presented in the tables above, JPMorgan Chase Bank, N.A. executes derivative transactions with affiliates as part of its client driven market-making activities and to facilitate hedging certain risks for its affiliates. To accomplish this, JPMorgan Chase Bank, N.A. enters into substantially offsetting derivative transactions with third-parties and records both the third party and related-party gains and losses in principal transactions revenue. The following table summarizes information on derivative receivables and payables with affiliates before and after netting adjustments for legally enforceable master netting agreements as of December 31, 2017 and December 31, 2016.

	2017		2016	
December 31, (in billions)	Gross derivative receivable/payable	Net derivative receivable/payable	Gross derivative receivable/payable	Net derivative receivable/payable
Derivative receivables from affiliates	**$ 48,110**	**$ 140**	$ 44,023	$ 1,363
Derivative payables to affiliates	**48,115**	**94**	44,185	1,524

Servicing agreements and fee arrangements

Through servicing agreements, JPMorgan Chase Bank, N.A. provides and receives operational support and services to and from JPMorgan Chase and its subsidiaries. These servicing agreements cover certain occupancy, marketing, communication and technology services, and other shared corporate service costs. JPMorgan Chase Bank, N.A. is allocated or allocates a share of the cost of the services over the relevant service period based on the agreed methodology. Fees earned by JPMorgan Chase Bank, N.A. for services provided to affiliates are recorded in all other income, and fees incurred by JPMorgan Chase Bank, N.A. for services from affiliates are recorded in noninterest expense.

Note 21 – Accumulated other comprehensive income/(loss)

AOCI includes the after-tax change in unrealized gains and losses on investment securities, foreign currency translation adjustments (including the impact of related derivatives), cash flow hedging activities, and net loss and prior service costs/(credit) related to JPMorgan Chase Bank, N.A.'s defined benefit pension and OPEB plans.

Year ended December 31, (in millions)	Unrealized gains/(losses) on investment securities[b]	Translation adjustments, net of hedges	Cash flow hedges	Defined benefit pension and OPEB plans	DVA on fair value option elected liabilities	Accumulated other comprehensive income/(loss)
Balance at December 31, 2014	$ 4,537	$ (23)	$ (91)	$ (467)	$ –	$ 3,956
Net change	(2,104)	(17)	46	139	–	(1,936)
Balance at December 31, 2015	$ 2,433	$ (40)	$ (45)	$ (328)	$ –	$ 2,020
Cumulative effect of change in accounting principle[a]	–	–	–	–	11	11
Net change	(1,037)	4	(55)	(27)	(51)	(1,166)
Balance at December 31, 2016	$ 1,396	$ (36)	$ (100)	$ (355)	(40)	$ 865
Net change	**687**	**(309)**	**176**	**11**	**(55)**	**510**
Balance at December 31, 2017	**$ 2,083**	**$ (345)**	**$ 76**	**$ (344)**	**$ (95)**	**$ 1,375**

(a) Effective January 1, 2016, JPMorgan Chase Bank, N.A. adopted new accounting guidance related to the recognition and measurement of financial liabilities where the fair value option has been elected. This guidance requires the portion of the total change in fair value caused by changes in JPMorgan Chase Bank, N.A. own credit risk (DVA) to be presented separately in OCI; previously these amounts were recognized in net income.
(b) Represents the after-tax difference between the fair value and amortized cost of securities accounted for as AFS, including net unamortized unrealized gains and losses related to AFS securities transferred to HTM.

The following table presents the pre-tax and after-tax changes in the components of OCI.

	2017			2016			2015		
Year ended December 31, (in millions)	Pretax	Tax effect	After-tax	Pretax	Tax effect	After-tax	Pretax	Tax effect	After-tax
Unrealized gains/(losses) on investment securities:									
Net unrealized gains/(losses) arising during the period	**$ 1,012**	**$ (371)**	**$ 641**	$(1,528)	$ 572	$ (956)	$(3,247)	$ 1,269	$(1,978)
Reclassification adjustment for realized (gains)/losses included in net income[a]	**73**	**(27)**	**46**	(130)	49	(81)	(202)	76	(126)
Net change	**1,085**	**(398)**	**687**	(1,658)	621	(1,037)	(3,449)	1,345	(2,104)
Translation adjustments[b]:									
Translation	**844**	**(616)**	**228**	118	(43)	75	(1,542)	562	(980)
Hedges	**(847)**	**310**	**(537)**	(109)	38	(71)	1,541	(578)	963
Net change	**(3)**	**(306)**	**(309)**	9	(5)	4	(1)	(16)	(17)
Cash flow hedges:									
Net unrealized gains/(losses) arising during the period	**147**	**(55)**	**92**	(449)	168	(281)	(97)	36	(61)
Reclassification adjustment for realized (gains)/losses included in net income[c][d]	**134**	**(50)**	**84**	360	(134)	226	174	(67)	107
Net change	**281**	**(105)**	**176**	(89)	34	(55)	77	(31)	46
Defined benefit pension and OPEB plans:									
Net gains/(losses) arising during the period	**38**	**(14)**	**24**	(150)	54	(96)	57	(21)	36
Reclassification adjustments included in net income[e]:									
Amortization of net loss	**34**	**(12)**	**22**	25	(10)	15	40	(15)	25
Prior service costs/(credits)	**(2)**	**1**	**(1)**	(2)	1	(1)	(2)	1	(1)
Settlement loss/(gain)	**2**	**(1)**	**1**	4	(1)	3	–	–	–
Foreign exchange and other	**(52)**	**17**	**(35)**	80	(28)	52	132	(53)	79
Net change	**20**	**(9)**	**11**	(43)	16	(27)	227	(88)	139
DVA on fair value option elected liabilities, net change:	**$ (86)**	**$ 31**	**$ (55)**	$ (83)	$ 32	$ (51)	$ –	$ –	$ –
Total other comprehensive income/(loss)	**$ 1,297**	**$ (787)**	**$ 510**	$(1,864)	$ 698	$(1,166)	$(3,146)	$ 1,210	$(1,936)

(a) The pre-tax amount is reported in securities gains/(losses) in the Consolidated statements of income.
(b) Reclassifications of pretax realized gains/(losses) on translation adjustments and related hedges are reported in other income/expense in the Consolidated statements of income. The amounts were not material for the periods presented.
(c) The pre-tax amounts are primarily recorded in noninterest revenue, net interest income and compensation expense in the Consolidated statements of income.
(d) In 2015, JPMorgan Chase Bank, N.A. reclassified approximately $150 million of net losses from AOCI to other income because JPMorgan Chase Bank, N.A. determined that it is probable that the forecasted interest payment cash flows would not occur. For additional information, see Note 6.
(e) The pre-tax amount is reported in compensation expense in the Consolidated statements of income.

Note 22 – Income taxes

The results of operations of JPMorgan Chase Bank, N.A. 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 JPMorgan Chase Bank, N.A. its share of the consolidated income tax expense or benefit based upon statutory rates applied to JPMorgan Chase Bank, N.A.'s earnings as if it were filing separate income tax returns. JPMorgan Chase Bank, N.A. uses the asset and liability method to provide for income taxes on all transactions recorded in the Consolidated Financial Statements. 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 JPMorgan Chase Bank, N.A.'s taxable income at the effective income tax rate applicable to the consolidated JPMorgan Chase entity.

The tax sharing arrangement between JPMorgan Chase and JPMorgan Chase Bank, N.A. allows for intercompany payments to or from JPMorgan Chase for outstanding current tax assets or liabilities.

Due to the inherent complexities arising from the nature of JPMorgan Chase Bank, N.A.'s businesses, and from conducting business and being taxed in a substantial number of jurisdictions, significant judgments and estimates are required to be made. Agreement of tax liabilities between JPMorgan Chase Bank, N.A. and the many tax jurisdictions in which JPMorgan Chase Bank, N.A. files tax returns may not be finalized for several years. Thus, JPMorgan Chase Bank, N.A.'s final tax-related assets and liabilities may ultimately be different from those currently reported.

Effective tax rate and expense

A reconciliation of the applicable statutory U.S. federal income tax rate to the effective tax rate for each of the years ended December 31, 2017, 2016 and 2015, is presented in the following table.

Effective tax rate

Year ended December 31,	**2017**	2016	2015
Statutory U.S. federal tax rate	**35.0%**	35.0%	35.0%
Increase/(decrease) in tax rate resulting from:			
U.S. state and local income taxes, net of U.S. federal income tax benefit	**1.7**	2.0	2.8
Tax-exempt income	**(3.0)**	(3.0)	(3.3)
Non-U.S. subsidiary earnings[(a)]	**(2.2)**	(2.3)	(5.2)
Business tax credits	**(2.3)**	(2.2)	(2.6)
Nondeductible legal expense	**–**	0.4	0.7
Impact of the TCJA	**7.2**	–	–
Other, net	**(0.2)**	(1.0)	(1.3)
Effective tax rate	**36.2%**	28.9%	26.1%

(a) Predominantly includes earnings of U.K. subsidiaries that were deemed to be reinvested indefinitely through December 31, 2017.

Impact of the TCJA

On December 22, 2017, the TCJA was signed into law. JPMorgan Chase Bank, N.A.'s effective tax rate increased in 2017 driven by a $2.1 billion income tax expense representing the estimated impact of the enactment of the TCJA. The $2.1 billion tax expense was predominantly driven by a deemed repatriation of JPMorgan Chase Bank, N.A.'s unremitted non-U.S. earnings and adjustments to the value of certain tax-oriented investments partially offset by a benefit from the revaluation of JPMorgan Chase Bank, N.A.'s net deferred tax liability.

The deemed repatriation of JPMorgan Chase Bank, N.A.'s unremitted non-U.S. earnings is based on the post-1986 earnings and profits of each controlled foreign corporation. The calculation resulted in an estimated income tax expense of $3.9 billion. Furthermore, accounting for income taxes requires the remeasurement of certain deferred tax assets and liabilities based on the rates at which they are expected to reverse in the future. JPMorgan Chase Bank, N.A. remeasured its deferred tax asset and liability balances in December of 2017 to the new statutory U.S. federal income tax rate of 21% as well as any federal benefit associated with state and local deferred income taxes. The remeasurement resulted in an estimated income tax benefit of $2.2 billion.

The deemed repatriation and remeasurement of deferred taxes were calculated based on all available information and published legislative guidance. These amounts are considered to be estimates under SEC Staff Accounting Bulletin No. 118 as JPMorgan Chase Bank, N.A. anticipates refinements to both calculations. Anticipated refinements will result from the issuance of future legislative and accounting guidance as well as those in the normal course of business, including true-ups to the tax liability on the tax return as filed and the resolution of tax audits.

Adjustments were also recorded to income tax expense for certain tax-oriented investments. These adjustments were due to changes to affordable housing proportional amortization resulting from the reduction of the federal income tax rate under the TCJA. SEC Staff Accounting Bulletin No. 118 does not apply to these adjustments.

The components of income tax expense/(benefit) included in the Consolidated statements of income were as follows for each of the years ended December 31, 2017, 2016, and 2015.

Income tax expense/(benefit)

Year ended December 31, (in millions)	**2017**	2016	2015
Current income tax expense/(benefit)			
U.S. federal	**$ 8,111**	$ 3,683	$ 3,109
Non-U.S.	**2,151**	1,565	963
U.S. state and local	**577**	656	858
Total current income tax expense/(benefit)	**10,839**	5,904	4,930
Deferred income tax expense/(benefit)			
U.S. federal	**(73)**	1,865	1,013
Non-U.S.	**(146)**	(73)	(94)
U.S. state and local	**114**	172	131
Total deferred income tax expense/(benefit)	**(105)**	1,964	1,050
Total income tax expense	**$ 10,734**	$ 7,868	$ 5,980

Total income tax expense includes $199 million, $34 million and $311 million of tax benefits recorded in 2017, 2016, and 2015, respectively, as a result of tax audit resolutions.

Tax effect of items recorded in Stockholder's equity
The preceding table does not reflect the tax effect of certain items that are recorded each period directly in stockholder's equity. The tax effect of all items recorded directly to stockholder's equity resulted in an decrease of $785 million in 2017, an increase of $695 million in 2016, and an increase of $1.2 billion in 2015.

Results from Non-U.S. earnings

The following table presents the U.S. and non-U.S. components of income before income tax expense for the years ended December 31, 2017, 2016 and 2015.

Year ended December 31, (in millions)	**2017**	2016	2015
U.S.	**$ 22,296**	$ 20,203	$ 16,691
Non-U.S.[(a)]	**7,368**	7,037	6,217
Income before income tax expense	**$ 29,664**	$ 27,240	$ 22,908

(a) For purposes of this table, non-U.S. income is defined as income generated from operations located outside the U.S.

Prior to December 31, 2017, U.S. federal income taxes had not been provided on the undistributed earnings of certain non-U.S. subsidiaries, to the extent that such earnings had been reinvested abroad for an indefinite period of time. JPMorgan Chase Bank, N.A. will no longer maintain the indefinite reinvestment assertion on the undistributed earnings of those non-U.S. subsidiaries in light of the enactment of the TCJA. The U.S. federal and state and local income taxes associated with the undistributed and previously untaxed earnings of those non-U.S. subsidiaries was included in the deemed repatriation charge recorded as of December 31, 2017.

JPMorgan Chase Bank, N.A. will treat any tax it may incur on global intangible low tax income as a period cost to tax expense when the tax is incurred.

Affordable housing tax credits

JPMorgan Chase Bank, N.A. recognized $1.7 billion, $1.6 billion and $1.5 billion of tax credits and other tax benefits associated with investments in affordable housing projects within income tax expense for the years 2017, 2016 and 2015, respectively. The amount of amortization of such investments reported in income tax expense under the current period presentation during these years was $1.6 billion, $1.1 billion and $1.0 billion, respectively. The carrying value of these investments, which are reported in other assets on JPMorgan Chase Bank, N.A.'s Consolidated balance sheets, was $7.7 billion and $8.5 billion at December 31, 2017 and 2016, respectively. The amount of commitments related to these investments, which are reported in accounts payable and other liabilities on JPMorgan Chase Bank, N.A.'s Consolidated balance sheets, was $2.4 billion and $2.7 billion at December 31, 2017 and 2016, respectively. The results are inclusive of any impacts from the TJCA.

Deferred taxes

Deferred income tax expense/(benefit) results from differences between assets and liabilities measured for financial reporting purposes versus income tax return purposes. Deferred tax assets are recognized if, in management's judgment, their realizability is determined to be more likely than not. If a deferred tax asset is determined to be unrealizable, a valuation allowance is established. The significant components of deferred tax assets and liabilities are reflected in the following table as of December 31, 2017 and 2016.

December 31, (in millions)		2017		2016
Deferred tax assets				
Allowance for loan losses	$	2,565	$	4,385
Employee benefits		469		1,539
Accrued expenses and other		1,622		3,399
Non-U.S. operations		322		3,640
Tax attribute carryforwards		49		40
Gross deferred tax assets		5,027		13,003
Valuation allowance		(27)		(14)
Deferred tax assets, net of valuation allowance	$	5,000	$	12,989
Deferred tax liabilities				
Depreciation and amortization	$	1,339	$	2,058
Mortgage servicing rights, net of hedges		2,757		4,807
Leasing transactions		3,317		3,852
Non-U.S. operations		319		3,357
Other, net		1,406		2,035
Gross deferred tax liabilities		9,138		16,109
Net deferred tax (liabilities)/assets	$	(4,138)	$	(3,120)

JPMorgan Chase Bank has recorded deferred tax assets of $49 million at December 31, 2017, in connection with U.S. federal and non-U.S. net operating loss ("NOL") carryforwards. At December 31, 2017, total U.S. federal NOL carryforwards were approximately $47 million and non-U.S. NOL carryforwards were approximately $128 million. If not utilized, the U.S. federal NOL carryforwards will expire between 2029 and 2036. Certain non-U.S. NOL carryforwards will expire between 2028 and 2034 whereas others have an unlimited carryforward period.

The valuation allowance at December 31, 2017, was due to certain non-U.S. NOL carryforwards.

Unrecognized tax benefits

At December 31, 2017, 2016 and 2015, JPMorgan Chase Bank, N.A.'s unrecognized tax benefits, excluding related interest expense and penalties, were $3.2 billion $2.4 billion and $2.0 billion, respectively, of which $2.4 billion, $1.9 billion and $1.6 billion, respectively, if recognized, would reduce the annual effective tax rate. Included in the amount of unrecognized tax benefits are certain items that would not affect the effective tax rate if they were recognized in the Consolidated statements of income. These unrecognized items include the tax effect of certain temporary differences, the portion of gross state and local unrecognized tax benefits that would be offset by the benefit from associated U.S. federal income tax deductions, and the portion of gross non-U.S. unrecognized tax benefits that would have offsets in other jurisdictions. JPMorgan Chase is presently under audit by a number of taxing authorities, most notably by the Internal Revenue Service as summarized in the Tax examination status table below.

As JPMorgan Chase Bank, N.A. is presently under audit by a number of taxing authorities, it is reasonably possible that over the next 12 months the resolution of these examinations may increase or decrease the gross balance of unrecognized tax benefits by as much as approximately $1.3 million. Upon settlement of an audit, the change in the unrecognized tax benefit would result from payment or income statement recognition.

The following table presents a reconciliation of the beginning and ending amount of unrecognized tax benefits for the years ended December 31, 2017, 2016 and 2015.

Year ended December 31, (in millions)	2017	2016	2015
Balance at January 1,	$ 2,416	$ 2,032	$ 2,195
Increases based on tax positions related to the current period	805	103	265
Increases based on tax positions related to prior periods	494	452	393
Decreases based on tax positions related to prior periods	(183)	(130)	(672)
Decreases related to cash settlements with taxing authorities	(327)	(3)	(149)
Decreases related to a lapse of applicable statute of limitations	–	(38)	–
Balance at December 31,	$ 3,204	$ 2,416	$ 2,032

After-tax interest expense/(benefit) and penalties related to income tax liabilities recognized in income tax expense were $79 million, $94 million and $4 million in 2017, 2016 and 2015, respectively.

At December 31, 2017 and 2016, in addition to the liability for unrecognized tax benefits, JPMorgan Chase Bank, N.A. had accrued $414 million and $493 million, respectively, for income tax-related interest and penalties.

Tax examination status

JPMorgan Chase Bank, N.A. is continually under examination by the Internal Revenue Service, by taxing authorities throughout the world, 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 Bank, N.A. and its consolidated subsidiaries as of December 31, 2017.

December 31, 2017	Periods under examination	Status
JPMorgan Chase – U.S.	2003 – 2005	At 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 – California	2011 – 2012	Field Examination
JPMorgan Chase – U.K.	2006 – 2015	Field examination of certain select entities

Note 23 – Restrictions on cash and intercompany funds transfers

The business of JPMorgan Chase Bank, N.A. is subject to examination and regulation by the OCC. JPMorgan Chase Bank, N.A. is a member of the U.S. Federal Reserve System, and its deposits in the U.S. are insured by the FDIC, subject to applicable limits.

The Federal Reserve requires depository institutions to maintain cash reserves with a Federal Reserve Bank. The average required amount of reserve balances deposited by JPMorgan Chase Bank, N.A. with a Federal Reserve Bank was approximately $24.9 billion and $19.3 billion in 2017 and 2016, respectively.

Restrictions imposed by U.S. federal law prohibit JPMorgan Chase & Co. and certain of its affiliates from borrowing from JPMorgan Chase Bank, N.A. and other banking subsidiaries unless the loans are secured in specified amounts. Such secured loans by JPMorgan Chase Bank, N.A. to any particular affiliate, together with certain other transactions with such affiliate (collectively referred to as “covered transactions”), are generally limited to 10% of JPMorgan Chase Bank, N.A.’s total capital, as determined by the risk-based capital guidelines; the aggregate amount of covered transactions between JPMorgan Chase Bank, N.A. and all affiliates is limited to 20% of JPMorgan Chase Bank, N.A.’s total capital.

In addition to dividend restrictions set forth in statutes and regulations, the OCC, and under certain circumstances the FDIC, have authority under the Financial Institutions Supervisory Act to prohibit or to limit the payment of dividends by the banking organizations they supervise, including JPMorgan Chase Bank, N.A. if, in the banking regulator’s opinion, payment of a dividend would constitute an unsafe or unsound practice in light of the financial condition of the banking organization.

At January 1, 2018, JPMorgan Chase Bank, N.A. could pay, in the aggregate, approximately $15 billion in dividends to JPMorgan Chase without the prior approval of its relevant banking regulators. The capacity to pay dividends in 2018 will be supplemented by JPMorgan Chase Bank, N.A.’s earnings during the year.

In compliance with rules and regulations established by U.S. and non-U.S. regulators, as of December 31, 2017 and 2016, cash in the amount of $8.9 billion and $6.1 billion, respectively, were segregated in special bank accounts for the benefit of securities and futures brokerage customers. Also, as of December 31, 2017 and 2016, JPMorgan Chase Bank, N.A. had:

- Receivables of $3.1 billion and $4.0 billion, respectively, consisting of cash pledged with clearing organizations for the benefit of customers.

In addition, as of December 31, 2017 and 2016, JPMorgan Chase Bank, N.A. had other restricted cash of $2.8 billion and $3.0 billion, respectively, primarily representing cash reserves held at non-U.S. central banks and held for other general purposes.

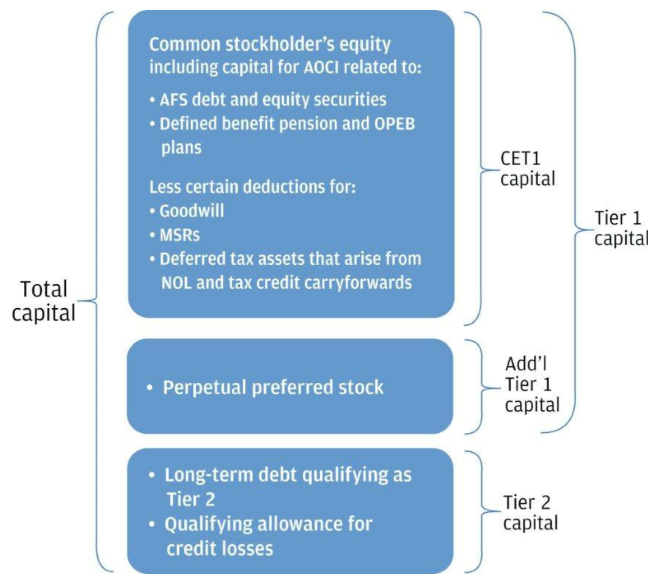
Note 24 – Regulatory capital

JPMorgan Chase Bank, N.A.’s banking regulator, the OCC, establishes capital requirements, including well-capitalized standards for national banks.

Basel III overview

Basel III capital rules for JPMorgan Chase Bank, N.A., set forth two comprehensive approaches for calculating risk-weighted assets (“RWA”): a standardized approach (“Basel III Standardized”) and an advanced approach (“Basel III Advanced”). Certain of the requirements of Basel III are subject to phase-in periods that began on January 1, 2014 and continue through the end of 2018 (“transitional period”).

The three categories of risk-based capital and their predominant components under the Basel III Transitional rules are illustrated below:



Risk-weighted assets

Basel III establishes capital requirements for calculating credit risk RWA and market risk RWA, and in the case of Basel III Advanced, operational risk RWA. Key differences in the calculation of credit risk RWA between the Standardized and Advanced approaches are that for Basel III Advanced, credit risk RWA is based on risk-sensitive approaches which largely rely on the use of internal credit models and parameters, whereas for Basel III Standardized, credit risk RWA is generally based on supervisory risk-weightings which vary primarily by counterparty type and asset class. Market risk RWA is calculated on a generally consistent basis between Basel III Standardized and Basel III Advanced. In addition to the RWA calculated under these approaches, JPMorgan Chase Bank, N.A. may supplement such amounts to incorporate management judgment and feedback from its bank regulators.

Supplementary leverage ratio ("SLR")
Basel III also includes a requirement for Advanced Approach banking organizations to calculate a SLR. The SLR is defined as Tier 1 capital under Basel III divided by JPMorgan Chase Bank, N.A.'s total leverage exposure. Total leverage exposure is calculated by taking JPMorgan Chase Bank, N.A.'s total average on-balance sheet assets, less amounts permitted to be deducted for Tier 1 capital, and adding certain off-balance sheet exposures, such as undrawn commitments and derivatives potential future exposure. As a well-capitalized IDI, JPMorgan Chase Bank, N.A. is required to have a minimum SLR of at least 6%, effective January 1, 2018.

Risk-based capital regulatory minimums
The Basel III rules include minimum capital ratio requirements that are subject to phase-in periods through the end of 2018.

JPMorgan Chase Bank, N.A. is required to hold additional amounts of capital to serve as a "capital conservation buffer". The capital conservation buffer is intended to be used to absorb potential losses in times of financial or economic stress. If not maintained, JPMorgan Chase Bank, N.A. could be limited in the amount of capital that may be distributed. The capital conservation buffer is subject to a phase-in period that began January 1, 2016 and continues through the end of 2018. When fully phased-in, JPMorgan Chase Bank, N.A. will be required to hold a 2.5% capital conservation buffer.

The countercyclical capital buffer takes into account the macro financial environment in which large, internationally active banks function. On September 8, 2016 the Federal Reserve published the framework that will apply to the setting of the countercyclical capital buffer. As of December 1, 2017, the Federal Reserve reaffirmed setting the U.S. countercyclical capital buffer at 0%, and stated that it will review the amount at least annually. The countercyclical capital buffer can be increased if the Federal Reserve, FDIC and OCC determine that credit growth in the economy has become excessive and can be set at up to an additional 2.5% of RWA subject to a 12-month implementation period.

Under the risk-based capital guidelines of the OCC, JPMorgan Chase Bank, N.A. is required to maintain minimum ratios of CET1, Tier 1 and Total capital to RWA, as well as a minimum leverage ratio (which is defined as Tier 1 capital divided by adjusted quarterly average assets). Failure to meet these minimum requirements could cause the OCC to take action.

The following table presents the minimum ratios to which JPMorgan Chase Bank, N.A. is subject as of December 31, 2017.

	Minimum capital ratios[(a)(c)]	Well-capitalized ratios[(b)]
Capital ratios		
CET1	5.75%	6.50%
Tier 1	7.25	8.00
Total	9.25	10.00
Tier 1 leverage	4.00	5.00

Note: The table above is as defined by the regulations issued by the OCC and FDIC and to which JPMorgan Chase Bank, N.A. and its IDI subsidiaries are subject.

(a) Represents requirements for JPMorgan Chase Bank, N.A. and its subsidiaries. The CET1 minimum capital ratio includes 1.25% resulting from the phase-in of the 2.5% capital conservation buffer that is applicable to IDI subsidiaries.
(b) Represents requirements for IDI subsidiaries pursuant to regulations issued under the FDIC Improvement Act.
(c) For the period ended December 31, 2016, the CET1, Tier 1, Total and Tier 1 leverage minimum capital ratios applicable to JPMorgan Chase Bank, N.A. were 5.125%, 6.625%, 8.625% and 4.0%, respectively.

As of December 31, 2017, and 2016, JPMorgan Chase Bank, N.A. was well-capitalized and met all capital requirements to which it was subject.

The following table presents the regulatory capital, assets and risk-based capital ratios for JPMorgan Chase Bank, N.A. under both Basel III Standardized Transitional and Basel III Advanced Transitional at December 31, 2017 and 2016.

	JPMorgan Chase Bank, N.A.				
	Basel III Standardized Transitional			**Basel III Advanced Transitional**	
(in millions, except ratios)	**Dec 31, 2017**	Dec 31, 2016		**Dec 31, 2017**	Dec 31, 2016
Regulatory capital					
CET1 capital	**$ 184,375**	$ 179,319		**$ 184,375**	$ 179,319
Tier 1 capital[a]	**184,375**	179,341		**184,375**	179,341
Total capital	**195,839**	191,662		**189,419**	184,637
Assets					
Risk-weighted	**1,335,809**	1,311,240	(e)	**1,226,534**	1,262,613
Adjusted average[b]	**2,116,031**	2,088,851		**2,116,031**	2,088,851
Capital ratios[c]					
CET1	**13.8%**	13.7%	(e)	**15.0%**	14.2%
Tier 1[a]	**13.8**	13.7	(e)	**15.0**	14.2
Total	**14.7**	14.6	(e)	**15.4**	14.6
Tier 1 leverage[d]	**8.7**	8.6		**8.7**	8.6

(a) Includes the deduction associated with the permissible holdings of covered funds (as defined by the Volcker Rule). The deduction was not material as of December 31, 2017 and 2016.
(b) Adjusted average assets, for purposes of calculating the Tier 1 leverage ratio, includes total quarterly average assets adjusted for unrealized gains/(losses) on AFS securities, less deductions for goodwill and other intangible assets, defined benefit pension plan assets, and deferred tax assets related to tax attributes, including NOLs.
(c) For each of the risk-based capital ratios, the capital adequacy of JPMorgan Chase Bank, N.A. and its IDI subsidiaries is evaluated against the lower of the two ratios as calculated under Basel III approaches (Standardized or Advanced) as required by the Collins Amendment of the Dodd-Frank Act (the "Collins Floor").
(d) The Tier 1 leverage ratio is not a risk-based measure of capital. This ratio is calculated by dividing Tier 1 capital by adjusted average assets.
(e) The prior period amounts have been revised to conform with the current period presentation.

Note 25 – Off-balance sheet lending-related financial instruments, guarantees, and other commitments

JPMorgan Chase Bank, N.A. provides lending-related financial instruments (e.g., commitments and guarantees) to meet the financing needs of its clients or customers. The contractual amount of these financial instruments represents the maximum possible credit risk to JPMorgan Chase Bank, N.A. should the counterparty draw upon the commitment or JPMorgan Chase Bank, N.A. 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 are refinanced, extended, cancelled, or expire without being drawn or a default occurring. As a result, the total contractual amount of these instruments is not, in JPMorgan Chase Bank, N.A.'s view, representative of its expected future credit exposure or funding requirements.

To provide for probable credit losses inherent in wholesale and certain consumer lending-commitments, an allowance for credit losses on lending-related commitments is maintained. See Note 14 for further information regarding the allowance for credit losses on lending-related commitments. The following table summarizes the contractual amounts and carrying values of off-balance sheet lending-related financial instruments, guarantees and other commitments at December 31, 2017 and 2016. The amounts in the table below for credit card and home equity lending-related commitments represent the total available credit for these products. JPMorgan Chase Bank, N.A. has not experienced, and does not anticipate, that all available lines of credit for these products will be utilized at the same time. JPMorgan Chase Bank, N.A. can reduce or cancel credit card lines of credit by providing the borrower notice or, in some cases as permitted by law, without notice. In addition, JPMorgan Chase Bank, N.A. typically closes credit card lines when the borrower is 60 days or more past due. JPMorgan Chase Bank, N.A. may reduce or close HELOCs when there are significant decreases in the value of the underlying property, or when there has been a demonstrable decline in the creditworthiness of the borrower.

Off–balance sheet lending-related financial instruments, guarantees and other commitments

By remaining maturity at December 31, (in millions)	Contractual amount 2017: Expires in 1 year or less	Contractual amount 2017: Expires after 1 year through 3 years	Contractual amount 2017: Expires after 3 years through 5 years	Contractual amount 2017: Expires after 5 years	Contractual amount 2017: Total	Contractual amount 2016: Total	Carrying value[i] 2017	Carrying value[i] 2016
Lending-related								
Consumer, excluding credit card:								
Home equity	**$ 2,165**	**$ 1,370**	**$ 1,379**	**$ 15,446**	**$ 20,360**	$ 21,713	**$ 12**	$ 12
Residential mortgage[a][b]	**5,723**	**—**	**—**	**13**	**5,736**	10,332	**—**	—
Auto	**8,007**	**872**	**292**	**84**	**9,255**	8,476	**2**	2
Consumer & business banking [b]	**11,642**	**926**	**112**	**522**	**13,202**	12,940	**19**	12
Total consumer, excluding credit card	**27,537**	**3,168**	**1,783**	**16,065**	**48,553**	53,461 [h]	**33**	26
Credit card	**12,127**	**—**	**—**	**—**	**12,127**	11,198	**—**	—
Total consumer[c]	**39,664**	**3,168**	**1,783**	**16,065**	**60,680**	64,659 [h]	**33**	26
Wholesale:								
Other unfunded commitments to extend credit[d][e]	**60,795**	**118,793**	**138,289**	**12,428**	**330,305**	324,221	**840**	905
Standby letters of credit and other financial guarantees[d]	**15,294**	**9,905**	**7,963**	**2,080**	**35,242**	36,170	**636**	586
Other letters of credit[d]	**3,459**	**114**	**139**	**—**	**3,712**	3,570	**3**	2
Total wholesale	**79,548**	**128,812**	**146,391**	**14,508**	**369,259**	363,961	**1,479**	1,493
Total lending-related	**$ 119,212**	**$ 131,980**	**$ 148,174**	**$ 30,573**	**$ 429,939**	$ 428,620 [h]	**$ 1,512**	$ 1,519
Other guarantees and commitments								
Securities lending indemnification agreements and guarantees[f]	**$ 191,302**	**$ —**	**$ —**	**$ —**	**$ 191,302**	$ 149,533	**$ —**	$ —
Derivatives qualifying as guarantees	**5,011**	**206**	**12,479**	**40,065**	**57,761**	51,278	**310**	48
Unsettled reverse repurchase and securities borrowing agreements	**61,610**	**—**	**—**	**—**	**61,610**	46,801	**—**	—
Unsettled repurchase and securities lending agreements	**32,750**	**—**	**—**	**—**	**32,750**	23,429	**—**	—
Loan sale and securitization-related indemnifications:								
Mortgage repurchase liability	**NA**	**NA**	**NA**	**NA**	**NA**	NA	**111**	129
Loans sold with recourse	**NA**	**NA**	**NA**	**NA**	**766**	2,274	**8**	31
Other guarantees and commitments[g]	**7,045**	**7,260**	**6,415**	**2,166**	**22,886**	25,962	**(82)**	(131)

(a) Includes certain commitments to purchase loans from correspondents.
(b) Certain loan portfolios have been reclassified. The prior period amounts have been revised to conform with the current period presentation.
(c) Predominantly all consumer lending-related commitments are in the U.S.
(d) At December 31, 2017 and 2016, reflected the contractual amount net of risk participations totaling $334 million and $328 million, respectively, for other unfunded commitments to extend credit; $10.4 billion and $11.1 billion, respectively, for standby letters of credit and other financial guarantees; and $405 million and $265 million, respectively, for other letters of credit. In regulatory filings with the Federal Reserve these commitments are shown gross of risk participations.
(e) At both December 31, 2017 and 2016, included commitments to affiliates of $16 million.
(f) At December 31, 2017 and 2016, collateral held by JPMorgan Chase Bank, N.A. in support of securities lending indemnification agreements was $200.9 billion and $155.9 billion, respectively. Securities lending collateral consist of primarily cash and securities issued by governments that are members G7 and U.S. government agencies.
(g) At December 31, 2017 and 2016, included guarantees of the obligations of affiliates of $14.2 billion and $21.3 billion, which predominantly relate to obligations arising under the affiliates' borrowing facilities at the FHLBs; and unfunded equity investment commitments of $32 million and $15 million, respectively. In addition, at both December 31, 2017 and 2016, included letters of credit hedged by derivative transactions and managed on a market risk basis of $4.5 billion and $4.6 billion.
(h) The prior period amounts have been revised to conform with the current period presentation.
(i) For lending-related products, the carrying value represents the allowance for lending-related commitments and the guarantee liability; for derivative-related products, the carrying value represents the fair value.

Other unfunded commitments to extend credit

Other unfunded commitments to extend credit generally consist of commitments for working capital and general corporate purposes, extensions of credit to support commercial paper facilities and bond financings in the event that those obligations cannot be remarketed to new investors, as well as committed liquidity facilities to clearing organizations. JPMorgan Chase Bank, N.A. also issues commitments under multipurpose facilities which could be drawn upon in several forms, including the issuance of a standby letter of credit.

JPMorgan Chase Bank, N.A. acts as a settlement and custody bank in the U.S. tri-party repurchase transaction market. In its role as settlement and custody bank, JPMorgan Chase Bank, N.A. is exposed to the intra-day credit risk of its cash borrower clients, usually broker-dealers. This exposure arises under secured clearance advance facilities that JPMorgan Chase Bank, N.A. extends to its clients (i.e. cash borrowers); these facilities contractually limit JPMorgan Chase Bank, N.A.'s intra-day credit risk to the facility amount and must be repaid by the end of the day. As of December 31, 2017 and 2016, the secured clearance advance facility maximum outstanding commitment amount was $3.5 billion and $4.4 billion, respectively.

Guarantees

U.S. GAAP requires that a guarantor recognize, at the inception of a guarantee, a liability in an amount equal to the fair value of the obligation undertaken in issuing the guarantee. U.S. GAAP defines a guarantee as a contract that contingently requires the guarantor to pay a guaranteed party based upon: (a) changes in an underlying asset, liability or equity security of the guaranteed party; or (b) a third party's failure to perform under a specified agreement. JPMorgan Chase Bank, N.A. considers the following off–balance sheet lending-related arrangements to be guarantees under U.S. GAAP: standby letters of credit and other financial guarantees, securities lending indemnifications, certain indemnification agreements included within third-party contractual arrangements and certain derivative contracts.

As required by U.S. GAAP, JPMorgan Chase Bank, N.A. initially records guarantees at the inception date fair value of the obligation assumed (e.g., the amount of consideration received or the net present value of the premium receivable). For certain types of guarantees, JPMorgan Chase Bank, N.A. records this fair value amount in other liabilities with an offsetting entry recorded in cash (for premiums received), or other assets (for premiums receivable). Any premium receivable recorded in other assets is reduced as cash is received under the contract, and the fair value of the liability recorded at inception is amortized into income as lending and deposit-related fees over the life of the guarantee contract. For indemnifications provided in sales agreements, a portion of the sale proceeds is allocated to the guarantee, which adjusts the gain or loss that would otherwise result from the transaction. For these indemnifications, the initial liability is amortized to income as JPMorgan Chase Bank, N.A.'s risk is reduced (i.e., over time or when the indemnification expires). Any contingent liability that exists as a result of issuing the guarantee or indemnification is recognized when it becomes probable and reasonably estimable. The contingent portion of the liability is not recognized if the estimated amount is less than the carrying amount of the liability recognized at inception (adjusted for any amortization). The recorded amounts of the liabilities related to guarantees and indemnifications at December 31, 2017 and 2016, excluding the allowance for credit losses on lending-related commitments, are discussed below.

Standby letters of credit and other financial guarantees

Standby letters of credit and other financial guarantees are conditional lending commitments issued by JPMorgan Chase Bank, N.A. to guarantee the performance of a client or customer to a third party under certain arrangements, such as commercial paper facilities, bond financings, acquisition financings, trade and similar transactions. The carrying values of standby and other letters of credit were $639 million and $588 million at December 31, 2017 and 2016, respectively, which were classified in accounts payable and other liabilities on the Consolidated balance sheets; these carrying values included $195 million and $147 million, respectively, for the allowance for lending-related commitments, and $444 million and $441 million, respectively, for the guarantee liability and corresponding asset.

The following table summarizes the types of facilities under which standby letters of credit and other letters of credit arrangements are outstanding by the ratings profiles of JPMorgan Chase Bank, N.A.'s clients, as of December 31, 2017 and 2016.

Standby letters of credit, other financial guarantees and other letters of credit

December 31, (in millions)	**2017**		2016	
	Standby letters of credit and other financial guarantees	Other letters of credit	Standby letters of credit and other financial guarantees	Other letters of credit
Investment-grade[(a)]	**$ 28,492**	**$ 2,646**	$ 28,245	$ 2,781
Noninvestment-grade[(a)]	**6,750**	**1,066**	7,702	789
Total contractual amount	**$ 35,242**	**$ 3,712**	$ 35,947	$ 3,570
Allowance for lending-related commitments	**$ 192**	**$ 3**	$ 145	$ 2
Guarantee liability	444	–	441	–
Total carrying value	**$ 636**	**$ 3**	$ 586	$ 2
Commitments with collateral	**$ 17,421**	**$ 878**	$ 19,346	$ 940

(a) The ratings scale is based on JPMorgan Chase Bank, N.A.'s internal ratings, which generally correspond to ratings as defined by S&P and Moody's.

Securities lending indemnifications

Through JPMorgan Chase Bank, N.A.'s securities lending program, counterparties' securities, via custodial and non-custodial arrangements, may be lent to third parties. As part of this program, JPMorgan Chase Bank, N.A. provides an indemnification in the lending agreements which protects the lender against the failure of the borrower to return the lent securities. To minimize its liability under these indemnification agreements, JPMorgan Chase Bank, N.A. obtains cash or other highly liquid collateral with a market value exceeding 100% of the value of the securities on loan from the borrower. Collateral is marked to market daily to help assure that collateralization is adequate. Additional collateral is called from the borrower if a shortfall exists, or collateral may be released to the borrower in the event of overcollateralization. If a borrower defaults, JPMorgan Chase Bank, N.A. would use the collateral held to purchase replacement securities in the market or to credit the lending client or counterparty with the cash equivalent thereof.

Derivatives qualifying as guarantees

JPMorgan Chase Bank, N.A. transacts certain derivative contracts that have the characteristics of a guarantee under U.S. GAAP. These contracts include written put options that require JPMorgan Chase Bank, N.A. to purchase assets upon exercise by the option holder at a specified price by a specified date in the future. JPMorgan Chase Bank, N.A.may enter into written put option contracts in order to meet client needs, or for other trading purposes. The terms of written put options are typically five years or less.

Derivatives deemed to be guarantees also includes stable value contracts, commonly referred to as "stable value products", that require JPMorgan Chase Bank, N.A. to make a payment of the difference between the market value and the book value of a counterparty's reference portfolio of assets in the event that market value is less than book value and certain other conditions have been met. Stable value products are transacted in order to allow investors to realize investment returns with less volatility than an unprotected portfolio. These contracts are typically longer-term or may have no stated maturity, but allow JPMorgan Chase Bank, N.A. to elect to terminate the contract under certain conditions.

The notional value of derivatives guarantees generally represents JPMorgan Chase Bank, N.A.'s maximum exposure. However, exposure to certain stable value products is contractually limited to a substantially lower percentage of the notional amount.

The fair value of derivative guarantees reflects the probability, in JPMorgan Chase Bank, N.A.'s view, of whether JPMorgan Chase Bank, N.A. will be required to perform under the contract. JPMorgan Chase Bank, N.A. 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.

The following table summarizes the derivatives qualifying as guarantees as of December 31, 2017 and 2016.

December 31, (in millions)	**2017**	2016
Notional amounts		
Derivative guarantees	**57,761**	51,278
Stable value contracts with contractually limited exposure	**29,104**	28,665
Maximum exposure of stable value contracts with contractually limited exposure	**3,053**	3,012
Fair value		
Derivative payables	**310**	64
Derivative receivables	–	16

In addition to derivative contracts that meet the characteristics of a guarantee, JPMorgan Chase Bank, N.A. is both a purchaser and seller of credit protection in the credit derivatives market. For a further discussion of credit derivatives, see 6.

Unsettled reverse repurchase and securities borrowing agreements, and unsettled repurchase and securities lending agreements

In the normal course of business, JPMorgan Chase Bank, N.A. enters into reverse repurchase agreements and securities borrowing agreements, which are secured financing agreements. Such agreements settle at a future date. At settlement, these commitments result in JPMorgan Chase Bank, N.A. advancing cash to and receiving securities collateral from the counterparty. JPMorgan Chase Bank, N.A. also enters into repurchase agreements and securities lending agreements. At settlement, these commitments result in JPMorgan Chase Bank N.A. receiving cash from and providing securities collateral to the counterparty. These agreements generally do not meet the definition of a derivative, and therefore, are not recorded on the Consolidated balance sheets until settlement date. These agreements predominantly consist of agreements with regular-way settlement periods. For a further discussion of securities purchased under resale agreements and securities borrowed, and securities sold under repurchase agreements and securities loaned, see Note 12.

Loan sales- and securitization-related indemnifications

Mortgage repurchase liability

In connection with JPMorgan Chase Bank, N.A.'s mortgage loan sale and securitization activities with GSEs, as described in Note 15, JPMorgan Chase Bank, N.A. has made representations and warranties that the loans sold meet certain requirements that may require JPMorgan Chase Bank, N.A. to repurchase mortgage loans and/or indemnify the loan purchaser. Further, although JPMorgan Chase Bank, N.A.'s securitizations are predominantly nonrecourse, JPMorgan Chase Bank, N.A. does provide recourse servicing in certain limited cases where it agrees to share credit risk with the owner of the mortgage loans. To the extent that repurchase demands that are received relate to loans that JPMorgan Chase Bank, N.A. purchased from third parties that remain viable, JPMorgan Chase Bank, N.A. typically will have the right to seek a recovery of related repurchase losses from the third party. Generally, the maximum amount of future payments JPMorgan Chase Bank, N.A. would be required to make for breaches of these representations and warranties would be equal to the unpaid principal balance of such loans that are deemed to have defects that were sold to purchasers (including securitization-related SPEs) plus, in certain circumstances, accrued interest on such loans and certain expenses.

Private label securitizations

The liability related to repurchase demands associated with private label securitizations is separately evaluated by JPMorgan Chase Bank, N.A. in establishing its litigation reserves.

For additional information regarding litigation, see Note 27.

Loans sold with recourse

JPMorgan Chase Bank, N.A. provides servicing for mortgages and certain commercial lending products on both a recourse and nonrecourse basis. In nonrecourse servicing, the principal credit risk to JPMorgan Chase Bank, N.A. is the cost of temporary servicing advances of funds (i.e., normal servicing advances). In recourse servicing, the servicer agrees to share credit risk with the owner of the mortgage loans, such as Fannie Mae or Freddie Mac or a private investor, insurer or guarantor. Losses on recourse servicing predominantly occur when foreclosure sales proceeds of the property underlying a defaulted loan are less than the sum of the outstanding principal balance, plus accrued interest on the loan and the cost of holding and disposing of the underlying property. JPMorgan Chase Bank, N.A.'s securitizations are predominantly nonrecourse, thereby effectively transferring the risk of future credit losses to the purchaser of the mortgage-backed securities issued by the trust. At December 31, 2017 and 2016, the unpaid principal balance of loans sold with recourse totaled $766 million and $2.3 billion, respectively. The carrying value of the related liability that JPMorgan Chase Bank, N.A. has recorded, which is representative of JPMorgan Chase Bank, N.A.'s view of the likelihood it will have to perform under its recourse obligations, was $8 million and $31 million at December 31, 2017 and 2016, respectively.

Other off-balance sheet arrangements

Indemnification agreements – general

In connection with issuing securities to investors outside the U.S., JPMorgan Chase Bank, N.A. may agree to pay additional amounts to the holders of the securities in the event that, due to a change in tax law, certain types of withholding taxes are imposed on payments on the securities. The terms of the securities may also give JPMorgan Chase Bank, N.A. the right to redeem the securities if such additional amounts are payable. The enactment of the TCJA will not cause JPMorgan Chase Bank, N.A. to become obligated to pay any such additional amounts. JPMorgan Chase Bank, N.A. may also enter into indemnification clauses in connection with the licensing of software to clients ("software licensees") or when it sells a business or assets to a third party ("third-party purchasers"), pursuant to which it indemnifies software licensees for claims of liability or damages that may occur subsequent to the licensing of the software, or third-party purchasers for losses they may incur due to actions taken by JPMorgan Chase Bank, N.A. prior to the sale of the business or assets. It is difficult to estimate JPMorgan Chase Bank, N.A.'s maximum exposure under these indemnification arrangements, since this would require an assessment of future changes in tax law and future claims that may be made against JPMorgan Chase Bank, N.A. that have not yet occurred. However, based on historical experience, management expects the risk of loss to be remote.

Card charge-backs
Under the rules of Visa USA, Inc., and MasterCard International, JPMorgan Chase Bank, N.A., is primarily liable for the amount of each processed card sales transaction that is the subject of a dispute between a cardmember and a merchant. If a dispute is resolved in the cardmember's favor, the merchant services business will (through the cardmember's issuing bank) credit or refund the amount to the cardmember and will charge back the transaction to the merchant. If the merchant services business is unable to collect the amount from the merchant, the merchant services business will bear the loss for the amount credited or refunded to the cardmember. The merchant services business mitigates this risk by withholding future settlements, retaining cash reserve accounts or by obtaining other security. However, in the unlikely event that: (1) a merchant ceases operations and is unable to deliver products, services or a refund; (2) The merchant services business does not have sufficient collateral from the merchant to provide cardmember refunds; and (3) The merchant services business does not have sufficient financial resources to provide cardmember refunds, JPMorgan Chase Bank, N.A., would recognize the loss.

The merchant services business incurred aggregate losses of $28 million, $85 million, and $12 million on $1,191.7 billion, $1,063.4 billion, and $949.3 billion of aggregate volume processed for the years ended December 31, 2017, 2016 and 2015, respectively. Incurred losses from merchant charge-backs are charged to other expense, with the offset recorded in a valuation allowance against accrued interest and accounts receivable on the Consolidated balance sheets. The carrying value of the valuation allowance was $7 million and $45 million at December 31, 2017 and 2016, respectively, which JPMorgan Chase Bank, N.A. believes, based on historical experience and the collateral held by the merchant services business of $141 million and $125 million at December 31, 2017 and 2016, respectively, is representative of the payment or performance risk to JPMorgan Chase Bank, N.A. related to charge-backs.

Clearing Services – Client Credit Risk
JPMorgan Chase Bank, N.A. provides clearing services for clients by 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, JPMorgan Chase Bank, N.A. 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 and initial margin 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, JPMorgan Chase Bank, N.A. is exposed to the risk of nonperformance by its clients, but is not liable to clients for the performance of the CCPs. Where possible, JPMorgan Chase Bank, N.A. seeks to mitigate its risk to the client through the collection of appropriate amounts of margin at inception and throughout the life of the transactions. JPMorgan Chase Bank, N.A. can also cease providing clearing services if clients do not adhere to their obligations under the clearing agreement. In the event of nonperformance by a client, JPMorgan Chase Bank, N.A. 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 JPMorgan Chase Bank, N.A. as a clearing member.

JPMorgan Chase Bank, N.A. reflects its exposure to nonperformance risk of the client through the recognition of margin receivables from clients and margin payables to CCPs; the clients' underlying securities or derivative contracts are not reflected in JPMorgan Chase Bank, N.A.'s Consolidated Financial Statements.

It is difficult to estimate JPMorgan Chase Bank, N.A.'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 upon historical experience, and the credit risk mitigants available to JPMorgan Chase Bank, N.A., management believes it is unlikely that JPMorgan Chase Bank, N.A. 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 JPMorgan Chase Bank, N.A. executes for its own account and records in its Consolidated Financial Statements, see Note 6.

Exchange & Clearing House Memberships
JPMorgan Chase Bank, N.A. 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 JPMorgan Chase Bank, N.A. 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 JPMorgan Chase Bank, N.A.'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 include a pro rata share of the residual losses after applying the guarantee fund. Additionally, certain clearing houses require JPMorgan Chase Bank, N.A. as a member to pay a pro rata share of losses that may result 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 JPMorgan Chase Bank, N.A.'s maximum possible exposure under these membership agreements, since this would require an assessment of future claims that may be made against JPMorgan Chase Bank, N.A. that have not yet occurred. However, based on historical experience, management expects the risk of loss to be remote.

Guarantees of subsidiaries and affiliates
In the normal course of business, JPMorgan Chase Bank, N.A. may provide counterparties with guarantees of certain of the trading and other obligations of its subsidiaries and affiliates on a contract-by-contract basis, as negotiated with JPMorgan Chase Bank, N.A.'s counterparties. The obligations of the subsidiaries are included on JPMorgan Chase Bank, N.A.'s Consolidated balance sheets or are reflected as off-balance sheet commitments; therefore, JPMorgan Chase Bank, N.A. has not recognized a separate liability for these guarantees. As at December 31, 2017 and 2016, JPMorgan Chase Bank, N.A. had provided guarantees of $14.2 billion and $21.3 billion, respectively, of the obligations of affiliates. JPMorgan Chase Bank, N.A. believes that the occurrence of any event that would trigger payments by JPMorgan Chase Bank, N.A. under these guarantees is remote.

Note 26 – Commitments, pledged assets and collateral

Lease commitments

At December 31, 2017, JPMorgan Chase Bank, N.A. and its subsidiaries were obligated under a number of noncancelable operating leases for premises and equipment used primarily for banking purposes. Certain leases contain renewal options or escalation clauses providing for increased rental payments based on maintenance, utility and tax increases, or they require JPMorgan Chase Bank, N.A. to perform restoration work on leased premises. No lease agreement imposes restrictions on JPMorgan Chase Bank, N.A.'s ability to pay dividends, engage in debt or equity financing transactions or enter into further lease agreements.

The following table presents required future minimum rental payments under operating leases with noncancelable lease terms that expire after December 31, 2017.

Year ended December 31, (in millions)	
2018	$ 1,341
2019	1,341
2020	1,228
2021	991
2022	785
After 2022	3,638
Total minimum payments required	9,324
Less: Sublease rentals under noncancelable subleases	(853)
Net minimum payment required	$ 8,471

Total rental expense was as follows.

Year ended December 31, (in millions)	**2017**	2016	2015
Gross rental expense	**$ 1,667**	$ 1,666	$ 1,672
Sublease rental income	**(208)**	(198)	(198)
Net rental expense	**$ 1,459**	$ 1,468	$ 1,474

Pledged assets

JPMorgan Chase Bank, N.A. may pledge financial assets that it owns to maintain potential borrowing capacity with central banks and for other purposes, including to secure borrowings and public deposits, collateralize repurchase and other securities financing agreements, and cover customer short sales. 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 balance sheets.

The following table presents JPMorgan Chase Bank, N.A.'s pledged assets.

December 31, (in billions)	**2017**	2016
Assets that may be sold or repledged or otherwise used by secured parties	**$ 74.6**	$ 71.8
Assets that may not be sold or repledged or otherwise used by secured parties	**39.0**	37.8
Assets pledged at Federal Reserve banks and FHLBs	**434.3**	388.7
Total assets pledged	**$ 547.9**	$ 498.3

Total assets pledged do not include assets of consolidated VIEs; these assets are used to settle the liabilities of those entities. See Note 15 for additional information on assets and liabilities of consolidated VIEs. For additional information on JPMorgan Chase Bank, N.A.'s securities financing activities, see Note 12, For additional information on the JPMorgan Chase Bank, N.A.'s long-term debt, see Note 19.

The significant components of JPMorgan Chase Bank, N.A.'s pledged assets were as follows.

December 31, (in billions)	2017	2016
Securities	$ 91.4	$ 104.1
Loans	378.1	321.4
Trading assets and other	78.4	72.8
Total assets pledged	**$ 547.9**	$ 498.3

Collateral

JPMorgan Chase Bank, N.A. accepts financial assets as collateral that it is permitted to sell or repledge, deliver or otherwise use. This collateral is generally obtained under resale agreements, securities borrowing agreements, customer margin loans and derivative agreements Collateral is generally used under repurchase agreements, securities lending agreements or to cover customer short sales and to collateralize deposits and derivative agreements.

The following table presents the fair value of collateral accepted.

December 31, (in billions)	2017	2016
Collateral permitted to be sold or repledged, delivered, or otherwise used	$ 590.8	$ 491.0 (a)
Collateral sold, repledged, delivered or otherwise used	482.9	396.6

(a) The prior period amount has been revised to conform with the current period presentation.

Note 27 – Litigation

Contingencies

As of December 31, 2017, JPMorgan Chase and its subsidiaries, including but not limited to JPMorgan Chase Bank, N.A., are defendants or putative defendants in numerous legal proceedings, including private, civil litigations and regulatory/government investigations. The litigations range from individual actions involving a single plaintiff to class action lawsuits with potentially millions of class members. Investigations involve both formal and informal proceedings, by both governmental agencies and self-regulatory organizations. These legal proceedings are at varying stages of adjudication, arbitration or investigation, and involve each of JPMorgan Chase's lines of business and geographies and a wide variety of claims (including common law tort and contract claims and statutory antitrust, securities and consumer protection claims), some of which present novel legal theories.

JPMorgan Chase believes the estimate of the aggregate range of reasonably possible losses, in excess of reserves established, for JPMorgan Chase's legal proceedings is from $0 to approximately $1.7 billion at December 31, 2017. This estimated aggregate range of reasonably possible losses was based upon currently available information for those proceedings in which JPMorgan Chase believes that an estimate of reasonably possible loss can be made. For certain matters, JPMorgan Chase does not believe that such an estimate can be made, as of that date. JPMorgan Chase's estimate of the aggregate range of reasonably possible losses involves significant judgment, given the number, variety and varying stages of the proceedings (including the fact that many are in preliminary stages), the existence in many such proceedings of multiple defendants (including JPMorgan Chase and JPMorgan Chase Bank, N.A.) whose share of liability has yet to be determined, the numerous yet-unresolved issues in many of the proceedings (including issues regarding class certification and the scope of many of the claims) and the attendant uncertainty of the various potential outcomes of such proceedings, including where JPMorgan Chase has made assumptions concerning future rulings by the court or other adjudicator, or about the behavior or incentives of adverse parties or regulatory authorities, and those assumptions prove to be incorrect. In addition, the outcome of a particular proceeding may be a result which JPMorgan Chase did not take into account in its estimate because JPMorgan Chase had deemed the likelihood of that outcome to be remote. Accordingly, JPMorgan Chase's estimate of the aggregate range of reasonably possible losses will change from time to time, and actual losses may vary significantly.

Set forth below are descriptions of JPMorgan Chase's material legal proceedings in which JPMorgan Chase and its subsidiaries (which in certain instances include JPMorgan Chase Bank, N.A.) are involved or have been named as parties.

Foreign Exchange Investigations and Litigation. JPMorgan Chase previously reported settlements with certain government authorities relating to its foreign exchange ("FX") sales and trading activities and controls related to those activities. FX-related investigations and inquiries by government authorities, including competition authorities, are ongoing, and JPMorgan Chase is cooperating with and working to resolve those matters. In May 2015, JPMorgan Chase pleaded guilty to a single violation of federal antitrust law. In January 2017, JPMorgan Chase was sentenced, with judgment entered thereafter. The Department of Labor has granted JPMorgan Chase a five-year exemption of disqualification, effective upon expiration of a temporary one-year exemption previously granted, that allows JPMorgan Chase and its affiliates to continue to rely on the Qualified Professional Asset Manager exemption under the Employee Retirement Income Security Act ("ERISA"). JPMorgan Chase will need to reapply in due course for a further exemption to cover the remainder of the ten-year disqualification period. Separately, in February 2017 the South Africa Competition Commission referred its FX investigation of JPMorgan Chase and other banks to the South Africa Competition Tribunal, which is conducting civil proceedings concerning that matter.

JPMorgan Chase is also one of a number of foreign exchange dealers defending a class action filed in the United States District Court for the Southern District of New York by U.S.-based plaintiffs, principally alleging violations of federal antitrust laws based on an alleged conspiracy to manipulate foreign exchange rates (the "U.S. class action"). In January 2015, JPMorgan Chase entered into a settlement agreement in the U.S. class action. Following this settlement, a number of additional putative class actions were filed seeking damages for persons who transacted FX futures and options on futures (the "exchanged-based actions"), consumers who purchased foreign currencies at allegedly inflated rates (the "consumer action"), participants or beneficiaries of qualified ERISA plans (the "ERISA actions"), and purported indirect purchasers of FX instruments (the "indirect purchaser action"). Since then, JPMorgan Chase has entered into a revised settlement agreement to resolve the consolidated U.S. class action, including the exchange-based actions, and that agreement has been preliminarily approved by the Court. The District Court has dismissed one of the ERISA actions, and the plaintiffs have filed an appeal. The consumer action, a second ERISA action and the indirect purchaser action remain pending in the District Court.

General Motors Litigation. JPMorgan Chase Bank, N.A. participated in, and was the Administrative Agent on behalf of a syndicate of lenders on, a $1.5 billion syndicated Term Loan facility ("Term Loan") for General Motors Corporation ("GM"). In July 2009, in connection with the GM bankruptcy proceedings, the Official Committee of Unsecured Creditors of Motors Liquidation Company ("Creditors Committee") filed a lawsuit against JPMorgan Chase Bank, N.A., in its individual capacity and as Administrative Agent for other lenders on the Term Loan, seeking to hold the underlying lien invalid based on the filing of a UCC-3 termination statement relating to the Term Loan. In January 2015, following several court proceedings, the United States Court of Appeals for the Second Circuit reversed the Bankruptcy Court's dismissal of the Creditors Committee's claim and remanded the case to the Bankruptcy Court with instructions to enter partial summary judgment for the Creditors Committee as to the termination statement. The proceedings in the Bankruptcy Court continue with respect to, among other things, additional defenses asserted by JPMorgan Chase Bank, N.A. and the value of additional collateral on the Term Loan that was unaffected by the filing of the termination statement at issue. In connection with that additional collateral, a trial in the Bankruptcy Court regarding the value of certain representative assets concluded in May 2017, and a ruling was issued in September 2017. The Bankruptcy Court found that 33 of the 40 representative assets are fixtures and that these fixtures generally should be valued on a "going concern" basis. The Creditors Committee is seeking leave to appeal the Bankruptcy Court's ruling that the fixtures should be valued on a "going concern" basis rather than on a liquidation basis. In addition, certain Term Loan lenders filed cross-claims in the Bankruptcy Court against JPMorgan Chase Bank, N.A. seeking indemnification and asserting various claims. The parties are engaged in mediation concerning, among other things, the characterization and value of the remaining additional collateral, in light of the Bankruptcy Court's ruling regarding the representative assets, as well as other issues, including the cross-claims.

Hopper Estate Litigation. JPMorgan Chase is a defendant in an action in connection with its role as an independent administrator of an estate. The plaintiffs sought in excess of $7 million in compensatory damages, primarily relating to attorneys' fees incurred by the plaintiffs. After a trial in probate court in Dallas, Texas that ended in September 2017, the jury returned a verdict against JPMorgan Chase, awarding plaintiffs their full compensatory damages and multiple billions in punitive damages. Notwithstanding the jury verdict, in light of legal limitations on the availability of damages, certain of the plaintiffs moved for entry of judgment in the total amount of approximately $71 million, including punitive damages, while another plaintiff has not yet moved for judgment. The court has not yet entered a judgment in this matter. The parties are engaged in post-trial briefing.

Interchange Litigation. A group of merchants and retail associations filed a series of class action complaints alleging that Visa and MasterCard, as well as certain banks, conspired to set the price of credit and debit card interchange fees and enacted respective rules in violation of antitrust laws. The parties settled the cases for a cash payment of $6.1 billion to the class plaintiffs (of which JPMorgan Chase's share is approximately 20%) and an amount equal to ten basis points of credit card interchange for a period of 8 months to be measured from a date within 60 days of the end of the opt-out period. The settlement also provided for modifications to each credit card network's rules, including those that prohibit surcharging credit card transactions. In December 2013, the District Court granted final approval of the settlement.

A number of merchants appealed to the United States Court of Appeals for the Second Circuit, which, in June 2016, vacated the District Court's certification of the class action and reversed the approval of the class settlement. In March 2017, the U.S. Supreme Court declined petitions seeking review of the decision of the Court of Appeals. The case has been remanded to the District Court for further proceedings consistent with the appellate decision.

In addition, certain merchants have filed individual actions raising similar allegations against Visa and MasterCard, as well as against JPMorgan Chase and other banks, and those actions are proceeding.

LIBOR and Other Benchmark Rate Investigations and Litigation. JPMorgan Chase has received subpoenas and requests for documents and, in some cases, interviews, from federal and state agencies and entities, including the U.S. Commodity Futures Trading Commission ("CFTC") and various state attorneys general, as well as the European Commission ("EC"), the Swiss Competition Commission ("ComCo") and other regulatory authorities and banking associations around the world relating primarily to the process by which interest rates were submitted to the British Bankers Association ("BBA") in connection with the setting of the BBA's London Interbank Offered Rate ("LIBOR") for various currencies, principally in 2007 and 2008. Some of the inquiries also relate to similar processes by which information on rates was submitted to the European Banking Federation ("EBF") in connection with the setting of the EBF's Euro Interbank Offered Rates ("EURIBOR") and to the Japanese Bankers' Association for the setting of Tokyo Interbank Offered Rates ("TIBOR") during similar time periods, as well as processes for the setting of U.S. dollar ISDAFIX rates and other reference rates in various parts of the world during similar time periods, including through 2012. JPMorgan Chase continues to cooperate with these ongoing investigations, and is currently engaged in discussions with the CFTC about resolving its U.S. dollar ISDAFIX-related investigation with respect to JPMorgan Chase. There is no assurance that such discussions will result in a settlement. As previously reported, JPMorgan Chase has resolved EC inquiries relating to Yen LIBOR and Swiss Franc LIBOR. In December 2016, JPMorgan Chase resolved ComCo inquiries relating to these same rates. ComCo's investigation relating to EURIBOR, to which JPMorgan Chase and other banks are subject, continues. In December 2016, the EC issued a decision against JPMorgan Chase and other banks finding an infringement of European antitrust rules relating to EURIBOR. JPMorgan Chase has filed an appeal with the European General Court.

In addition, JPMorgan Chase has been named as a defendant along with other banks in a series of individual and putative class actions filed in various United States District Courts. These actions have been filed, or consolidated for pre-trial purposes, in the United States District Court for the Southern District of New York. In these actions, plaintiffs make varying allegations that in various periods, starting in 2000 or later, defendants either individually or collectively manipulated various benchmark rates by submitting rates that were artificially low or high. Plaintiffs allege that they transacted in loans, derivatives or other financial instruments whose values are affected by changes in these rates and assert a variety of claims including antitrust claims seeking treble damages. These matters are in various stages of litigation.

JPMorgan Chase has agreed to settle a putative class action related to Swiss franc LIBOR, and that settlement remains subject to final court approval.

In an action related to EURIBOR, the District Court dismissed all claims except a single antitrust claim and two common law claims, and dismissed all defendants except JPMorgan Chase and Citibank.

In actions related to U.S. dollar LIBOR, the District Court dismissed certain claims, including antitrust claims brought by some plaintiffs whom the District Court found did not have standing to assert such claims, and permitted antitrust claims, claims under the Commodity Exchange Act and common law claims to proceed. The plaintiffs whose antitrust claims were dismissed for lack of standing have filed an appeal. In May 2017, plaintiffs in three putative class actions moved in the District Court for class certification, and JPMorgan Chase and other defendants have opposed that motion. In January 2018, the District Court heard oral arguments on the class certification motions and reserved decision.

In an action related to the Singapore Interbank Offered Rate and the Singapore Swap Offer Rate, the District Court dismissed without prejudice all claims except a single antitrust claim, and dismissed without prejudice all defendants except JPMorgan Chase, Bank of America and Citibank. The plaintiffs filed an amended complaint in September 2017, which JPMorgan Chase and other defendants have moved to dismiss.

JPMorgan Chase is one of the defendants in a number of putative class actions alleging that defendant banks and ICAP conspired to manipulate the U.S. dollar ISDAFIX rates. In April 2016, JPMorgan Chase settled this litigation, along with certain other banks. Those settlements have been preliminarily approved by the Court.

Mortgage-Backed Securities and Repurchase Litigation and Related Regulatory Investigations. JPMorgan Chase and affiliates (together, "JPMC"), Bear Stearns and affiliates (together, "Bear Stearns") and certain Washington Mutual affiliates (together, "Washington Mutual") have been named as defendants in a number of cases in their various roles in offerings of MBS. The remaining civil cases include one investor action and actions for repurchase of mortgage loans. JPMorgan Chase and certain of its current and former officers and Board members have also been sued in a shareholder derivative action relating to JPMorgan Chase's MBS activities, which remains pending.

Issuer Litigation - Individual Purchaser Actions. With the exception of one remaining action, JPMorgan Chase has resolved all of the individual actions brought against JPMC, Bear Stearns and Washington Mutual as MBS issuers (and, in some cases, also as underwriters of their own MBS offerings).

Repurchase Litigation. JPMorgan Chase is defending a few actions brought by trustees and/or securities administrators of various MBS trusts on behalf of purchasers of securities issued by those trusts. These cases generally allege breaches of various representations and warranties regarding securitized loans and seek repurchase of those loans or equivalent monetary relief, as well as indemnification of attorneys' fees and costs and other remedies. The trustees and/or securities administrators have accepted settlement offers on these MBS transactions, and these settlements are subject to court approval.

In addition, JPMorgan Chase and a group of 21 institutional MBS investors made a binding offer to the trustees of MBS issued by JPMC and Bear Stearns providing for the payment of $4.5 billion and the implementation of certain servicing changes by JPMC, to resolve all repurchase and servicing claims that have been asserted or could have been asserted with respect to 330 MBS trusts created between 2005 and 2008. The offer does not resolve claims relating to Washington Mutual MBS. The trustees (or separate and successor trustees) for this group of 330 trusts have accepted the settlement for 319 trusts in whole or in part and excluded from the settlement 16 trusts in whole or in part. The trustees' acceptance received final approval from the court and JPMorgan Chase paid the settlement in December 2017.

Additional actions have been filed against third-party trustees that relate to loan repurchase and servicing claims involving trusts sponsored by JPMC, Bear Stearns and Washington Mutual.

In actions against JPMorgan Chase involving offerings of MBS issued by JPMorgan Chase, JPMorgan Chase has contractual rights to indemnification from sellers of mortgage loans that were securitized in such offerings. However, certain of those indemnity rights may prove effectively unenforceable in various situations, such as where the loan sellers are now defunct.

JPMorgan Chase has entered into agreements with a number of MBS trustees or entities that purchased MBS that toll applicable statute of limitations periods with respect to their claims, and has settled, and in the future may settle, tolled claims. There is no assurance that JPMorgan Chase will not be named as a defendant in additional MBS-related litigation.

Derivative Action. A shareholder derivative action against JPMorgan Chase, as nominal defendant, and certain of its current and former officers and members of its Board of Directors relating to JPMorgan Chase's MBS activities was filed in California federal court in 2013. In June 2017, the court granted defendants' motion to dismiss the cause of action that alleged material misrepresentations and omissions in JPMorgan Chase's proxy statement, found that the court did not have personal jurisdiction over the individual defendants with respect to the remaining causes of action, and transferred that remaining portion of the case to the United States District Court for the Southern District of New York without ruling on the merits. The motion by the defendants to dismiss is pending.

Municipal Derivatives Litigation. Several civil actions were commenced in New York and Alabama courts against JPMorgan Chase relating to certain Jefferson County, Alabama (the "County") warrant underwritings and swap transactions. The claims in the civil actions generally alleged that JPMorgan Chase made payments to certain third parties in exchange for being chosen to underwrite more than $3.0 billion in warrants issued by the County and to act as the counterparty for certain swaps executed by the County. The County filed for bankruptcy in November 2011. In June 2013, the County filed a Chapter 9 Plan of Adjustment, as amended (the "Plan of Adjustment"), which provided that all the above-described actions against JPMorgan Chase would be released and dismissed with prejudice. In November 2013, the Bankruptcy Court confirmed the Plan of Adjustment, and in December 2013, certain sewer rate payers filed an appeal challenging the confirmation of the Plan of Adjustment. All conditions to the Plan of Adjustment's effectiveness, including the dismissal of the actions against JPMorgan Chase, were satisfied or waived and the transactions contemplated by the Plan of Adjustment occurred in December 2013. Accordingly, all the above-described actions against JPMorgan Chase have been dismissed pursuant to the terms of the Plan of Adjustment. The appeal of the Bankruptcy Court's order confirming the Plan of Adjustment remains pending.

Petters Bankruptcy and Related Matters. JPMorgan Chase and certain of its affiliates, including One Equity Partners ("OEP"), were named as defendants in several actions filed in connection with the receivership and bankruptcy proceedings pertaining to Thomas J. Petters and certain affiliated entities (collectively, "Petters") and the Polaroid Corporation. The principal actions against JPMorgan Chase and its affiliates were brought by a court-appointed receiver for Petters and the trustees in bankruptcy proceedings for three Petters entities. These actions generally sought to avoid certain putative transfers in connection with (i) the 2005 acquisition by Petters of Polaroid, which at the time was majority-owned by OEP; (ii) two credit facilities that JPMorgan Chase and other financial institutions entered into with Polaroid; and (iii) a credit line and investment accounts held by Petters. In January 2017, the Court substantially denied the defendants' motion to dismiss an amended complaint filed by the plaintiffs. In October 2017, JPMorgan Chase and its affiliates reached an agreement in principle to settle the litigation brought by the Petters bankruptcy trustees, or their successors, and the receiver for Thomas J. Petters. The settlement is subject to final documentation and Court approval.

Wendel. Since 2012, the French criminal authorities have been investigating a series of transactions entered into by senior managers of Wendel Investissement ("Wendel") during the period from 2004 through 2007 to restructure their shareholdings in Wendel. JPMorgan Chase Bank, N.A., Paris branch provided financing for the transactions to a number of managers of Wendel in 2007. JPMorgan Chase has cooperated with the investigation. The investigating judges issued an ordonnance de renvoi in November 2016, referring JPMorgan Chase Bank, N.A. to the French tribunal correctionnel for alleged complicity in tax fraud. No date for trial has been set by the court. JPMorgan Chase has been successful in legal challenges made to the Court of Cassation, France's highest court, with respect to the criminal proceedings. In January 2018, the Paris Court of

Appeal issued a decision cancelling the *mise en examen* of JPMorgan Chase Bank, N.A. JPMorgan Chase is requesting clarification from the Court of Cassation concerning the Court of Appeal's decision before seeking direction on next steps in the criminal proceedings. In addition, a number of the managers have commenced civil proceedings against JPMorgan Chase Bank, N.A. The claims are separate, involve different allegations and are at various stages of proceedings.

* * *

In addition to the various legal proceedings discussed above, JPMorgan Chase and its subsidiaries, including in certain cases, JPMorgan Chase Bank, N.A., are named as defendants or are otherwise involved in a substantial number of other legal proceedings. JPMorgan Chase and JPMorgan Chase Bank, N.A., each believe it has meritorious defenses to the claims asserted against it in its currently outstanding legal proceedings and it intends to defend itself vigorously. Additional legal proceedings may be initiated from time to time in the future.

JPMorgan Chase Bank, N.A. has established reserves for several hundred of its currently outstanding legal proceedings. In accordance with the provisions of U.S. GAAP for contingencies, JPMorgan Chase Bank, N.A. 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. JPMorgan Chase Bank, N.A. evaluates its outstanding legal proceedings each quarter 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. During the years ended December 31, 2017, 2016 and 2015, JPMorgan Chase's legal expense was a benefit of $(139) million, a benefit of $(289) million, and an expense of $2.0 billion, respectively. Where a particular litigation matter involves one or more subsidiaries or affiliates of JPMorgan Chase, JPMorgan Chase determines the appropriate allocation of legal expense among those subsidiaries or affiliates (including, where applicable, JPMorgan Chase Bank, N.A.). There is no assurance that JPMorgan Chase Bank N.A.'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, particularly where the claimants seek very large or indeterminate damages, or where the matters present novel legal theories, involve a large number of parties or are in early stages of discovery, JPMorgan Chase and JPMorgan Chase Bank, N.A. 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 consequences related to those matters. JPMorgan Chase Bank, N.A. 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 JPMorgan Chase Bank, N.A.'s consolidated financial condition. JPMorgan Chase Bank, N.A. 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 JPMorgan Chase Bank N.A.'s operating results for a particular period, depending on, among other factors, the size of the loss or liability imposed and the level of JPMorgan Chase Bank, N.A.'s income for that period.

Note 28 – Business changes and developments

Internal transfers of legal entities under common control

From time to time there may be transfers of legal entities under common control between JPMorgan Chase Bank, N.A. and JPMorgan Chase. Such transfers are accounted for at historical cost in accordance with U.S. GAAP. However, all transfers were reflected in the Consolidated Financial Statements prospectively, and not as of the beginning of the applicable periods presented, because the impact of the transfers was not material to JPMorgan Chase Bank, N.A.'s Consolidated Financial Statements.

During the years ended December 31, 2017 and 2016, there were no significant transfers of legal entities.

On August 31, 2015, JPMorgan Chase merged its wholly-owned subsidiary, JPMorgan Bank and Trust Company, N.A. ("JPMBT"), into JPMorgan Chase Bank, N.A. JPMBT's principal activity was a borrowing relationship with the Federal Home Loan Bank of San Francisco ("FHLB SF"); and a custody business serving California insurance companies and other institutions. At the time of the merger, JPMBT had approximately $15.9 billion of assets, predominantly consisting of $9.9 billion of deposits with banks and $4.9 billion of loans; liabilities were $14.3 billion, consisting of long-term debt. There were no other significant transfers of legal entities for the year ended December 31, 2015.

Subsequent events

JPMorgan Chase Bank, N.A. has performed an evaluation of events that have occurred subsequent to December 31, 2017, and through February 27, 2018 (the date of the filing of this report). There have been no material subsequent events that occurred during such period that would require disclosure or recognition in JPMorgan Chase Bank, N.A.'s Consolidated Financial Statements as of December 31, 2017.

2017 Form 10-K: Annual report on Form 10-K for year ended December 31, 2017, filed with the U.S. Securities and Exchange Commission.

ABS: Asset-backed securities

Active foreclosures: Loans referred to foreclosure where formal foreclosure proceedings are ongoing. Includes both judicial and non-judicial states.

AFS: Available-for-sale

AOCI: Accumulated other comprehensive income/(loss)

ARM: Adjustable rate mortgage(s)

Beneficial interests issued by consolidated VIEs: Represents the interest of third-party holders of debt, equity securities, or other obligations, issued by VIEs that JPMorgan Chase Bank, N.A. consolidates.

Benefit obligation: Refers to the projected benefit obligation for pension plans and the accumulated postretirement benefit obligation for OPEB plans.

BHC: Bank holding company

CCP: "Central counterparty" is a clearing house that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the future performance of open contracts. A CCP becomes counterparty to trades with market participants through novation, an open offer system, or another legally binding arrangement.

CDS: Credit default swaps

CET1 Capital: Common equity Tier 1 Capital

CFO: Chief Financial Officer

CFTC: Commodity Futures Trading Commission

CIO: Chief Investment Office

CLO: Collateralized loan obligations

Collateral-dependent: A loan is considered to be collateral-dependent when repayment of the loan is expected to be provided solely by the underlying collateral, rather than by cash flows from the borrower's operations, income or other resources.

Credit derivatives: Financial instruments whose value is derived from the credit risk associated with the debt of a third-party issuer (the reference entity) which allow one party (the protection purchaser) to transfer that risk to another party (the protection seller). Upon the occurrence of a credit event by the reference entity, which may include, among other events, the bankruptcy or failure to pay its obligations, or certain restructurings of the debt of the reference entity, neither party 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 at the time of settling the credit derivative contract. The determination as to whether a credit event has occurred is generally made by the relevant International Swaps and Derivatives Association ("ISDA") Determinations Committee.

Criticized: Criticized loans, lending-related commitments and derivative receivables that are classified as special mention, substandard and doubtful categories for regulatory purposes and are generally consistent with a rating of CCC+/Caa1 and below, as defined by S&P and Moody's.

CRO: Chief Risk Officer

CVA: Credit valuation adjustments

Dodd-Frank Act: Wall Street Reform and Consumer Protection Act

DOJ: U.S. Department of Justice

DOL: U.S. Department of Labor

DRPC: Board of Directors' Risk Policy Committee

DVA: Debit valuation adjustment

EC: European Commission

Embedded derivatives: are implicit or explicit terms or features of a financial instrument that affect some or all of the cash flows or the value of the instrument in a manner similar to a derivative. An instrument containing such terms or features is referred to as a "hybrid." The component of the hybrid that is the non-derivative instrument is referred to as the "host." For example, callable debt is a hybrid instrument that contains a plain vanilla debt instrument (i.e., the host) and an embedded option that allows the issuer to redeem the debt issue at a specified date for a specified amount (i.e., the embedded derivative). However, a floating rate instrument is not a hybrid composed of a fixed-rate instrument and an interest rate swap.

ERISA: Employee Retirement Income Security Act of 1974

ETD: "Exchange-traded derivatives": Derivative contracts that are executed on an exchange and settled via a central clearing house.

EU: European Union

Fannie Mae: Federal National Mortgage Association

FASB: Financial Accounting Standards Board

FCA: Financial Conduct Authority

FDIA: Federal Depository Insurance Act

FDIC: Federal Deposit Insurance Corporation

Federal Reserve: The Board of the Governors of the Federal Reserve System

FFIEC: Federal Financial Institutions Examination Council

FHA: Federal Housing Administration

FHLB: Federal Home Loan Bank

FICO score: A measure of consumer credit risk provided by credit bureaus, typically produced from statistical models by Fair Isaac Corporation utilizing data collected by the credit bureaus.

FVA: Funding valuation adjustment

FX: Foreign exchange

G7: Group of Seven nations: Countries in the G7 are Canada, France, Germany, Italy, Japan, the U.K. and the U.S.

G7 government bonds: Bonds issued by the government of one of the G7 nations.

Ginnie Mae: Government National Mortgage Association

GSE: Fannie Mae and Freddie Mac

GSIB: Global systemically important banks

HELOAN: Home equity loan

HELOC: Home equity line of credit

Home equity – senior lien: Represents loans and commitments where JPMorgan Chase Bank, N.A. holds the first security interest on the property.

Home equity – junior lien: Represents loans and commitments where JPMorgan Chase Bank, N.A. holds a security interest that is subordinate in rank to other liens.

HTM: Held-to-maturity

IDI: Insured depository institutions

Impaired loan: Impaired loans are loans measured at amortized cost, for which it is probable that JPMorgan Chase Bank, N.A. will be unable to collect all amounts due, including principal and interest, according to the contractual terms of the agreement. Impaired loans include the following:

- All wholesale nonaccrual loans
- All TDRs (both wholesale and consumer), including ones that have returned to accrual status

Interchange income: A fee paid to a credit card issuer in the clearing and settlement of a sales or cash advance transaction.

Investment-grade: An indication of credit quality based on JPMorgan Chase Bank, N.A.'s internal risk assessment system. "Investment grade" generally represents a risk profile similar to a rating of a "BBB-"/"Baa3" or better, as defined by independent rating agencies.

ISDA: International Swaps and Derivatives Association

JPMorgan Chase: JPMorgan Chase & Co.

JPMorgan Chase Bank, N.A.: JPMorgan Chase Bank, National Association

LCR: Liquidity coverage ratio

LGD: Loss given default

LIBOR: London Interbank Offered Rate

LLC: Limited Liability Company

LTIP: Long-term incentive plan

LTV: "Loan-to-value": For residential real estate loans, the relationship, expressed as a percentage, between the principal amount of a loan and the appraised value of the collateral (i.e., residential real estate) securing the loan.

Origination date LTV ratio

The LTV ratio at the origination date of the loan. Origination date LTV ratios are calculated based on the actual appraised values of collateral (i.e., loan-level data) at the origination date.

Current estimated LTV ratio

An estimate of the LTV as of a certain date. The current estimated LTV ratios are calculated using estimated collateral values derived from a nationally recognized home price index measured at the metropolitan statistical area ("MSA") level. These MSA-level home price indices consist of actual data to the extent available and forecasted data where actual data is not available. As a result, the estimated collateral values used to calculate these ratios do not represent actual appraised loan-level collateral values; as such, the resulting LTV ratios are necessarily imprecise and should therefore be viewed as estimates.

Combined LTV ratio

The LTV ratio considering all available lien positions, as well as unused lines, related to the property. Combined LTV ratios are used for junior lien home equity products.

Master netting agreement: A single agreement with a counterparty that permits multiple transactions governed by that agreement to be terminated or accelerated 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).

Merchant services business: is a business that primarily processes transactions for merchants.

MBS: Mortgage-backed securities

Moody's: Moody's Investor Services

Mortgage product types:

Alt-A

Alt-A loans are generally higher in credit quality than subprime loans but have characteristics that would disqualify the borrower from a traditional prime loan. Alt-A lending characteristics may include one or more of the following: (i) limited documentation; (ii) a high combined loan-to-value ("CLTV") ratio; (iii) loans secured by non-owner occupied properties; or (iv) a debt-to-income ratio above normal limits. A substantial proportion of JPMorgan Chase Bank, N.A.'s Alt-A loans are those where a borrower does not provide complete documentation of his or her assets or the amount or source of his or her income.

Option ARMs

The option ARM real estate loan product is an adjustable-rate mortgage loan that provides the borrower with the option each month to make a fully amortizing, interest-only or minimum payment. The minimum payment on an option ARM loan is based on the interest rate charged during the introductory period. This introductory rate is usually significantly below the fully indexed rate. The fully indexed rate is calculated using an index rate plus a margin. Once the introductory period ends, the contractual interest rate charged on the loan increases to the fully indexed rate and adjusts monthly to reflect movements in the index. The minimum payment is typically insufficient to cover interest accrued in the prior month, and any unpaid interest is deferred and added to the principal balance of the loan. Option ARM loans are subject to payment recast, which converts the loan to a variable-rate fully amortizing loan upon meeting specified loan balance and anniversary date triggers.

Prime

Prime mortgage loans are made to borrowers with good credit records who meet specific underwriting requirements, including prescriptive requirements related to income and overall debt levels. New prime mortgage borrowers provide full documentation and generally have reliable payment histories.

Subprime

Subprime loans are loans that, prior to mid-2008, were offered to certain customers with one or more high risk characteristics, including but not limited to: (i) unreliable or poor payment histories; (ii) a high LTV ratio of greater than 80% (without borrower-paid mortgage insurance); (iii) a high debt-to-income ratio; (iv) an occupancy type for the loan is other than the borrower's primary residence; or (v) a history of delinquencies or late payments on the loan.

MSA: Metropolitan statistical areas

MSR: Mortgage servicing rights

NA: Data is not applicable or available for the period presented.

NAV: Net Asset Value

NOL: Net operating loss

Nonaccrual loans: Loans for which interest income is not recognized on an accrual basis. Loans (other than credit card loans and certain consumer loans insured by U.S. government agencies) are placed on nonaccrual status when full payment of principal and interest is not expected, regardless of delinquency status, or when principal and interest have been in default for a period of 90 days or more unless the loan is both well-secured and in the process of collection. Collateral-dependent loans are typically maintained on nonaccrual status.

OAS: Option-adjusted spread

OCC: Office of the Comptroller of the Currency

OCI: Other comprehensive income/(loss)

OPEB: Other postretirement employee benefit

Over-the-counter ("OTC") derivatives: Derivative contracts that are negotiated, executed and settled bilaterally between two derivative counterparties, where one or both counterparties is a derivatives dealer.

Over-the-counter cleared ("OTC-cleared") derivatives: Derivative contracts that are negotiated and executed bilaterally, but subsequently settled via a central clearing house, such that each derivative counterparty is only exposed to the default of that clearing house.

OTTI: Other-than-temporary impairment

PCI: "Purchased credit-impaired" loans represents certain loans that were acquired and deemed to be credit-impaired on the acquisition date in accordance with the guidance of the FASB. The guidance allows purchasers to aggregate credit-impaired loans acquired in the same fiscal quarter into one or more pools, provided that the loans have common risk characteristics(e.g., product type, LTV ratios, FICO scores, past due status, geographic location). A pool is then accounted for as a single asset with a single composite interest rate and an aggregate expectation of cash flows.

PD: Probability of default

Principal transactions revenue: Principal transactions revenue is driven by many factors, including the bid-offer spread, which is the difference between the price at which JPMorgan Chase Bank, N.A. is willing to buy a financial or other instrument and the price at which JPMorgan Chase Bank, N.A. is willing to sell that instrument. It also consists of realized (as a result of closing out or termination of transactions, or interim cash payments) and unrealized (as a result of changes in valuation) gains and losses on financial and other instruments (including those accounted for under the fair value option) primarily used in client-driven market-making activities and on private equity investments. In connection with its client-driven market-making activities, JPMorgan Chase Bank, N.A. transacts in debt and equity instruments, derivatives and commodities (including physical commodities inventories and financial instruments that reference commodities).

Principal transactions revenue also includes certain realized and unrealized gains and losses related to hedge accounting and specified risk-management activities, including: (a) certain derivatives designated in qualifying hedge accounting relationships (primarily fair value hedges of commodity and foreign exchange risk), (b) certain derivatives used for specific risk management purposes, primarily to mitigate credit risk and foreign exchange risk, and (c) other derivatives.

PSU(s): Performance share units

REIT: "Real estate investment trust": A special purpose investment vehicle that provides investors with the ability to participate directly in the ownership or financing of real-estate related assets by pooling their capital to purchase and manage income property (i.e., equity REIT) and/or mortgage loans (i.e., mortgage REIT). REITs can be publicly or privately held and they also qualify for certain favorable tax considerations.

Receivables from customers: Primarily represents margin loans to brokerage customers that are collateralized through assets maintained in the clients' brokerage accounts, as such no allowance is held against these receivables. These receivables are reported within accrued interest and accounts receivable on JPMorgan Chase Bank, N.A.'s Consolidated balance sheets.

REO: Real estate owned

Retained loans: Loans that are held-for-investment (i.e., excludes loans held-for-sale and loans at fair value).

RHS: Rural Housing Service of the U.S. Department of Agriculture

Risk-rated portfolio: Credit loss estimates are based on estimates of the probability of default ("PD") and loss severity given a default. The probability of default is the likelihood that a borrower will default on its obligation; the loss given default ("LGD") is the estimated loss on the loan that would be realized upon the default and takes into consideration collateral and structural support for each credit facility.

RWA: "Risk-weighted assets": Basel III establishes two comprehensive methodologies for calculating RWA (a Standardized approach and an Advanced approach) which include capital requirements for credit risk, market risk, and in the case of Basel III Advanced, also operational risk. Key differences in the calculation of credit risk RWA between the Standardized and Advanced approaches are that for Basel III Advanced, credit risk RWA is based on risk-sensitive approaches which largely rely on the use of internal credit models and parameters, whereas for Basel III Standardized, credit risk RWA is generally based on supervisory risk-weightings which vary primarily by counterparty type and asset class. Market risk RWA is calculated on a generally consistent basis between Basel III Standardized and Basel III Advanced.

RSU(s): Restricted stock units

S&P: Standard and Poor's 500 Index

SAR(s): Stock appreciation rights

Scored portfolio: The scored portfolio predominantly includes residential real estate loans, credit card loans and certain auto and business banking loans where credit loss estimates are based on statistical analysis of credit losses over discrete periods of time. The statistical analysis uses portfolio modeling, credit scoring and decision-support tools.

SEC: Securities and Exchange Commission

SLR: Supplementary leverage ratio

SMBS: Stripped mortgage-backed securities

SOA: Society of Actuaries

SPEs: Special purpose entities

Structured notes: Structured notes are predominantly financial instruments containing embedded derivatives.

TDR: "Troubled debt restructuring" is deemed to occur when JPMorgan Chase Bank, N.A. modifies the original terms of a loan agreement by granting a concession to a borrower that is experiencing financial difficulty.

TLAC: Total Loss Absorbing Capacity

U.K.: United Kingdom

Unaudited: Financial statements and information that have not been subjected to auditing procedures sufficient to permit an independent certified public accountant to express an opinion.

U.S.: United States of America

U.S. GAAP: Accounting principles generally accepted in the U.S.

U.S. government-sponsored enterprises ("U.S. GSEs") and U.S. GSE obligations: In the U.S., GSEs are quasi-governmental, privately held entities established by Congress to improve the flow of credit to specific sectors of the economy and provide certain essential services to the public. U.S. GSEs include Fannie Mae and Freddie Mac, but do not include Ginnie Mae, which is directly owned by the U.S. Department of Housing and Urban Development. U.S. GSE obligations are not explicitly guaranteed as to the timely payment of principal and interest by the full faith and credit of the U.S. government.

U.S. LCR: Liquidity coverage ratio under the final U.S. rule.

U.S. Treasury: U.S. Department of the Treasury

VA: U.S. Department of Veterans Affairs

VCG: Valuation Control Group

VGF: Valuation Governance Forum

VIEs: Variable interest entities

Warehouse loans: Consist of prime mortgages originated with the intent to sell that are accounted for at fair value and classified as trading assets.

Washington Mutual transaction: On September 25, 2008, JPMorgan Chase acquired certain of the assets of the banking operations of Washington Mutual Bank ("Washington Mutual") from the FDIC.