BANK OF AMERICA CORP /DE/
Form 10-K
February 26, 2019

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all card fees are recognized at the transaction date, except for certain time-based fees such as annual fees, which are recognized over 12 months. Other Revenue Measurement and Recognition Policies The Corporation did not disclose the value of any open performance obligations at December 31, 2018, as its contracts with customers generally have a fixed term that is less than one year, an open term with a cancellation period that is less than one year, or provisions that allow the Corporation to recognize revenue at the amount it has the right to
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

(Mark One)

[ ] ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2018

or

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

For the transition period from to

Commission file number:
1-6523

Exact name of registrant as specified in its charter:

Bank of America Corporation

State or other jurisdiction of incorporation or organization:
Delaware
IRS Employer Identification No.:
56-0906609
Address of principal executive offices:
Bank of America Corporate Center
100 N. Tryon Street
Charlotte, North Carolina 28255
Registrant’s telephone number, including area code:
(704) 386-5681
Securities registered pursuant to section 12(b) of the Act:

Title of each class	**Name of each exchange on which registered**
Common Stock, par value $0.01 per share	New York Stock Exchange

Depositary Shares, each representing a 1/1,000th interest in a share of Floating Rate Non-Cumulative Preferred Stock, Series E	New York Stock Exchange
Depositary Shares, each representing a 1/1,000th interest in a share of 6.625% Non-Cumulative Preferred Stock, Series W	New York Stock Exchange
Depositary Shares, each representing a 1/1,000th interest in a share of 6.500% Non-Cumulative Preferred Stock, Series Y	New York Stock Exchange
Depositary Shares, each representing a 1/1,000th interest in a share of 6.200% Non-Cumulative Preferred Stock, Series CC	New York Stock Exchange
Depositary Shares, each representing a 1/1,000th interest in a share of 6.000% Non-Cumulative Preferred Stock, Series EE	New York Stock Exchange
Depositary Shares, each representing a 1/1,000th interest in a share of 6.000% Non-Cumulative Preferred Stock, Series GG	New York Stock Exchange
Depositary Shares, each representing a 1/1,000th interest in a share of 6.000% Non-Cumulative Preferred Stock, Series HH	New York Stock Exchange
7.25% Non-Cumulative Perpetual Convertible Preferred Stock, Series L	New York Stock Exchange
Depositary Shares, each representing a 1/1,200th interest in a share of Bank of America Corporation Floating Rate Non-Cumulative Preferred Stock, Series 1	New York Stock Exchange

Title of each class	**Name of each exchange on which registered**
Depositary Shares, each representing a 1/1,200th interest in a share of Bank of America Corporation Floating Rate Non-Cumulative Preferred Stock, Series 2	New York Stock Exchange
Depositary Shares, each representing a 1/1,200th interest in a share of Bank of America Corporation Floating Rate Non-Cumulative Preferred Stock, Series 4	New York Stock Exchange
Depositary Shares, each representing a 1/1,200th interest in a share of Bank of America Corporation Floating Rate Non-Cumulative Preferred Stock, Series 5	New York Stock Exchange
Floating Rate Preferred Hybrid Income Term Securities of BAC Capital Trust XIII (and the guarantee related thereto)	New York Stock Exchange
5.63% Fixed to Floating Rate Preferred Hybrid Income Term Securities of BAC Capital Trust XIV (and the guarantee related thereto)	New York Stock Exchange
Income Capital Obligation Notes initially due December 15, 2066 of Bank of America Corporation	New York Stock Exchange
Senior Medium-Term Notes, Series A, Step Up Callable Notes, due November 28, 2031 of BofA Finance LLC (and the guarantee of the Registrant with respect thereto)	New York Stock Exchange

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

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

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

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

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer	Accelerated filer o	Non-accelerated filer o	Smaller reporting company o
			Emerging growth company o

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

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

The aggregate market value of the registrant's common stock ("Common Stock") held on June 30, 2018 by non-affiliates was approximately $282,258,554,953 (based on the June 30, 2018 closing price of Common Stock of $28.19 per share as reported on the New York Stock Exchange). At February 25, 2019, there were 9,658,759,764 shares of Common Stock outstanding.

Documents incorporated by reference: Portions of the definitive proxy statement relating to the registrant's 2019 annual meeting of stockholders are incorporated by reference in this Form 10-K in response to Items 10, 11, 12, 13 and 14 of Part III.

Table of Contents

Bank of America Corporation and Subsidiaries

Part I

Bank of America Corporation and Subsidiaries

Item 1. Business

Bank of America Corporation is a Delaware corporation, a bank holding company (BHC) and a financial holding company. When used in this report, “the Corporation” may refer to Bank of America Corporation individually, Bank of America Corporation and its subsidiaries, or certain of Bank of America Corporation’s subsidiaries or affiliates. As part of our efforts to streamline the Corporation’s organizational structure and reduce complexity and costs, the Corporation has reduced and intends to continue to reduce the number of its corporate subsidiaries, including through intercompany mergers.

Bank of America is one of the world’s largest financial institutions, serving individual consumers, small- and middle-market businesses, institutional investors, large corporations and governments with a full range of banking, investing, asset management and other financial and risk management products and services. Our principal executive offices are located in the

Bank of America Corporate Center, 100 North Tryon Street, Charlotte, North Carolina 28255.

Bank of America’s website is www.bankofamerica.com and the Investor Relations portion of our website is http://investor.bankofamerica.com. We use our website to distribute company information, including as a means of disclosing material, non-public information and for complying with our disclosure obligations under Regulation FD. We routinely post and make accessible financial and other information regarding the Corporation on our website. Accordingly, investors should monitor the Investor Relations portion of our website, in addition to following our press releases, U.S. Securities and Exchange Commission (SEC) filings, public conference calls and webcasts. Our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the

Securities Exchange Act of 1934 (Exchange Act) are available on the Investor Relations portion of our website under the heading Financial Information (accessible by clicking on the SEC Filings link) as soon as reasonably practicable after we electronically file such reports with, or furnish them to, the SEC and at the SEC's website, www.sec.gov. Notwithstanding the foregoing, the information contained on our website as referenced in this paragraph is not incorporated by reference into this Annual Report on Form 10-K. Also, we make available on the Investor Relations portion of our website under the heading Corporate Governance: (i) our Code of Conduct (including our insider trading policy); (ii) our Corporate Governance Guidelines (accessible by clicking on the Governance Highlights link); and (iii) the charter of each active committee of our Board of Directors (the Board) (accessible by clicking on the committee names under the Committee Composition link). We also intend to disclose any amendments to our Code of Conduct and waivers of our Code of Conduct required to be disclosed by the rules of the SEC and the New York Stock Exchange (NYSE) on the Investor Relations portion of our website. All of these corporate governance materials are also available free of charge in print to shareholders who request them in writing to: Bank of America Corporation, Attention: Office of the Corporate Secretary, Hearst Tower, 214 North Tryon Street, NC1-027-18-05, Charlotte, North Carolina 28255.

Segments

Through our banking and various nonbank subsidiaries throughout the U.S. and in international markets, we provide a diversified range of banking and nonbank financial services and products through four business segments: *Consumer Banking*, *Global Wealth & Investment Management (GWIM), Global Banking* and *Global Markets,* with the remaining operations recorded in *All Other*. Additional information related to our business segments and the products and services they provide is included in the information set forth on pages 30 through 39 of Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations (MD&A) and *Note 23 – Business Segment Information* to the Consolidated Financial Statements.

Competition

We operate in a highly competitive environment. Our competitors include banks, thrifts, credit unions, investment banking firms, investment advisory firms, brokerage firms, investment companies, insurance companies, mortgage banking companies, credit card issuers, mutual fund companies, hedge funds, private equity firms, and e-commerce and other internet-based companies. We compete with some of these competitors globally and with others on a regional or product specific basis.

Competition is based on a number of factors including, among others, customer service, quality and range of products and services offered, price, reputation, interest rates on loans and deposits, lending limits and customer convenience. Our ability to continue to compete effectively also depends in large part on our ability to attract new employees and retain and motivate our existing employees, while managing compensation and other costs.

Employees

At December 31, 2018, we had approximately 204,000 employees. None of our domestic employees are subject to a collective bargaining agreement. Management considers our employee relations to be good.

Government Supervision and Regulation

The following discussion describes, among other things, elements of an extensive regulatory framework applicable to BHCs, financial holding companies, banks and broker-dealers, including specific information about Bank of America.

We are subject to an extensive regulatory framework applicable to BHCs, financial holding companies and banks and other financial services entities. U.S. federal regulation of banks, BHCs and financial holding companies is intended primarily for the protection of depositors and the Deposit Insurance Fund (DIF) rather than for the protection of shareholders and creditors.

As a registered financial holding company and BHC, the Corporation is subject to the supervision of, and regular inspection by, the Board of Governors of the Federal Reserve System (Federal Reserve). Our U.S. bank subsidiaries (the Banks) organized as national banking associations are subject to regulation, supervision and examination by the Office of the Comptroller of the Currency (OCC), the Federal Deposit Insurance Corporation (FDIC) and the Federal Reserve. U.S. financial holding companies, and the companies under their control, are permitted to engage in activities considered "financial in nature" as defined by the Gramm-Leach-Bliley Act and related Federal Reserve interpretations. Unless otherwise limited by the Federal Reserve, a financial holding company may engage directly or indirectly in activities considered financial in nature provided the financial holding company gives the Federal Reserve after-the-fact notice of the new activities. The Gramm-Leach-Bliley Act also permits national banks to engage in activities considered financial in nature through a financial subsidiary, subject to certain conditions and limitations and with the approval of the OCC.

The scope of the laws and regulations and the intensity of the supervision to which we are subject have increased in recent years in response to the financial crisis, as well as other factors such as technological and market changes. In addition, the banking and financial services sector is subject to substantial regulatory enforcement and fines. Many of these changes have occurred as a result of the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act (the Financial Reform Act). We cannot assess whether there will be any additional major changes in the regulatory environment and expect that our business will remain subject to extensive regulation and supervision.

We are also subject to various other laws and regulations, as well as supervision and examination by other regulatory agencies, all of which directly or indirectly affect our operations and management and our ability to make distributions to shareholders. For instance, our broker-dealer subsidiaries are subject to both U.S. and international regulation, including supervision by the SEC, New York Stock Exchange and Financial Industry Regulatory Authority, among others; our commodities businesses in the U.S. are subject to regulation by and supervision of the U.S. Commodity Futures Trading Commission (CFTC); our U.S. derivatives activity is subject to regulation and supervision of the CFTC, National Futures Association and SEC, and in the case of the Banks, certain banking regulators; our insurance activities are subject to licensing and regulation by state insurance regulatory agencies; and our consumer financial products and services are regulated by the Consumer Financial Protection Bureau (CFPB).

Our non-U.S. businesses are also subject to extensive regulation by various non-U.S. regulators, including governments, securities exchanges, prudential regulators, central banks and other regulatory bodies, in the jurisdictions in which those businesses operate. For example, our financial services operations in the United Kingdom (U.K.) are subject to regulation by the Prudential Regulatory Authority and Financial Conduct

Authority (FCA) and, in Ireland, the European Central Bank and Central Bank of Ireland.

Source of Strength

Under the Financial Reform Act and Federal Reserve policy, BHCs are expected to act as a source of financial strength to each subsidiary bank and to commit resources to support each such subsidiary. Similarly, under the cross-guarantee provisions of the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA), in the event of a loss suffered or anticipated by the FDIC, either as a result of default of a bank subsidiary or related to FDIC assistance provided to such a subsidiary in danger of default, the affiliate banks of such a subsidiary may be assessed for the FDIC's loss, subject to certain exceptions.

Transactions with Affiliates

Pursuant to Section 23A and 23B of the Federal Reserve Act, as implemented by the Federal Reserve's Regulation W, the Banks are subject to restrictions that limit certain types of transactions between the Banks and their nonbank affiliates. In general, U.S. banks are subject to quantitative and qualitative limits on extensions of credit, purchases of assets and certain other transactions involving its nonbank affiliates. Additionally, transactions between U.S. banks and their nonbank affiliates are required to be on arm's length terms and must be consistent with standards of safety and soundness.

Deposit Insurance

Deposits placed at U.S. domiciled banks are insured by the FDIC, subject to limits and conditions of applicable law and the FDIC's regulations. Pursuant to the Financial Reform Act, FDIC insurance coverage limits are $250,000 per customer. All insured depository institutions are required to pay assessments to the FDIC in order to fund the DIF. The FDIC is required to maintain at least a designated minimum ratio of the DIF to insured deposits in the U.S. The Financial Reform Act requires the FDIC to assess insured depository institutions to achieve a DIF ratio of at least 1.35 percent by September 30, 2020. In November 2018, the FDIC announced that the DIF ratio exceeded 1.35 in advance of the deadline and that the related surcharges ceased. Additionally, the FDIC adopted regulations that establish a long-term target DIF ratio of greater than two percent. As of the date of this report, the DIF ratio is below this required target and the FDIC has adopted a restoration plan that may result in increased deposit insurance assessments. Deposit insurance assessment rates are subject to change by the FDIC and will be impacted by the overall economy and the stability of the banking industry as a whole. For more information regarding deposit insurance, see Item 1A. Risk Factors – Regulatory, Compliance and Legal on page 13.

Capital, Liquidity and Operational Requirements

As a financial holding company, we and our bank subsidiaries are subject to the regulatory capital and liquidity guidelines issued by the Federal Reserve and other U.S. banking regulators, including the FDIC and the OCC. These rules are complex and are evolving as U.S. and international regulatory authorities propose and enact enhanced capital and liquidity rules. The Corporation seeks to manage its capital position to maintain sufficient capital to meet these regulatory guidelines and to support our business activities. These evolving rules are likely to influence our planning processes and may require additional regulatory capital and liquidity, as well as impose additional operational and compliance costs on the Corporation. In addition, the Federal Reserve and the OCC have adopted guidelines that establish minimum standards for the design, implementation and board oversight of BHCs' and national

banks' risk governance frameworks. The Federal Reserve also issued a final rule, which became effective January 1, 2019, that includes minimum external total loss-absorbing capacity (TLAC) and long-term debt requirements.

For more information on regulatory capital rules, capital composition and pending or proposed regulatory capital changes, see Capital Management – Regulatory Capital in the MD&A on page 44, and *Note 16 – Regulatory Requirements and Restrictions* to the Consolidated Financial Statements, which are incorporated by reference in this Item 1.

Distributions

We are subject to various regulatory policies and requirements relating to capital actions, including payment of dividends and common stock repurchases. For instance, Federal Reserve regulations require major U.S. BHCs to submit a capital plan as part of an annual Comprehensive Capital Analysis and Review (CCAR). The purpose of the CCAR for the Federal Reserve is to assess the capital planning process of the BHC, including any planned capital actions, such as payment of dividends and common stock repurchases.

Our ability to pay dividends is also affected by the various minimum capital requirements and the capital and non-capital standards established under the FDICIA. The right of the Corporation, our shareholders and our creditors to participate in any distribution of the assets or earnings of our subsidiaries is further subject to the prior claims of creditors of the respective subsidiaries.

If the Federal Reserve finds that any of our Banks are not "well-capitalized" or "well-managed," we would be required to enter into an agreement with the Federal Reserve to comply with all applicable capital and management requirements, which may contain additional limitations or conditions relating to our activities. Additionally, the applicable federal regulatory authority is authorized to determine, under certain circumstances relating to the financial condition of a bank or BHC, that the payment of dividends would be an unsafe or unsound practice and to prohibit payment thereof.

For more information regarding the requirements relating to the payment of dividends, including the minimum capital requirements, see *Note 13 – Shareholders' Equity* and *Note 16 – Regulatory Requirements and Restrictions* to the Consolidated Financial Statements.

Many of our subsidiaries, including our bank and broker-dealer subsidiaries, are subject to laws that restrict dividend payments, or authorize regulatory bodies to block or reduce the flow of funds from those subsidiaries to the parent company or other subsidiaries.

Resolution Planning

As a BHC with greater than $50 billion of assets, the Corporation is required by the Federal Reserve and the FDIC to periodically submit a plan for a rapid and orderly resolution in the event of material financial distress or failure. Such resolution plan is intended to be a detailed roadmap for the orderly resolution of the BHC and its material entities pursuant to the U.S. Bankruptcy Code and other applicable resolution regimes under one or more hypothetical scenarios assuming no extraordinary government assistance.

If both the Federal Reserve and the FDIC determine that the BHC's plan is not credible, the Federal Reserve and the FDIC may jointly impose more stringent capital, leverage or liquidity requirements or restrictions on growth, activities or operations. A description of our plan is available on the Federal Reserve and FDIC websites.

The FDIC also requires the submission of a resolution plan for Bank of America, N.A. (BANA), which must describe how the insured depository institution would be resolved under the bank resolution provisions of the Federal Deposit Insurance Act. A description of this plan is available on the FDIC's website.

We continue to make substantial progress to enhance our resolvability, including simplifying our legal entity structure and business operations, and increasing our preparedness to implement our resolution plan, both from a financial and operational standpoint.

Across international jurisdictions, resolution planning is the responsibility of national resolution authorities (RA). Of most impact to the Corporation are the requirements associated with subsidiaries in the U.K., Ireland and France, where rules have been issued requiring the submission of significant information about locally-incorporated subsidiaries, as well as the Corporation's affiliated branches located in those jurisdictions (including information on intra-group dependencies, legal entity separation and barriers to resolution) to allow the RA to plan their resolution strategies. As a result of the RA's review of the submitted information, we could be required to take certain actions over the next several years which could increase operating costs and potentially result in the restructuring of certain businesses and subsidiaries.

For more information regarding our resolution plan, see Item 1A. Risk Factors – Liquidity on page6.

Insolvency and the Orderly Liquidation Authority

Under the Federal Deposit Insurance Act, the FDIC may be appointed receiver of an insured depository institution if it is insolvent or in certain other circumstances. In addition, under the Financial Reform Act, when a systemically important financial institution (SIFI) such as the Corporation is in default or danger of default, the FDIC may be appointed receiver in order to conduct an orderly liquidation of such institution. In the event of such appointment, the FDIC could, among other things, invoke the orderly liquidation authority, instead of the U.S. Bankruptcy Code, if the Secretary of the Treasury makes certain financial distress and systemic risk determinations. The orderly liquidation authority is modeled in part on the Federal Deposit Insurance Act, but also adopts certain concepts from the U.S. Bankruptcy Code.

The orderly liquidation authority contains certain differences from the U.S. Bankruptcy Code. For example, in certain circumstances, the FDIC could permit payment of obligations it determines to be systemically significant (e.g., short-term creditors or operating creditors) in lieu of paying other obligations (e.g., long-term creditors) without the need to obtain creditors' consent or prior court review. The insolvency and resolution process could also lead to a large reduction or total elimination of the value of a BHC's outstanding equity, as well as impairment or elimination of certain debt.

Under the FDIC's "single point of entry" strategy for resolving SIFIs, the FDIC could replace a distressed BHC with a bridge holding company, which could continue operations and result in an orderly resolution of the underlying bank, but whose equity is held solely for the benefit of creditors of the original BHC.

Furthermore, the Federal Reserve requires that BHCs maintain minimum levels of long-term debt required to provide adequate loss absorbing capacity in the event of a resolution.

For more information regarding our resolution, see Item 1A. Risk Factors – Liquidity on page6.

Limitations on Acquisitions

The Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 permits a BHC to acquire banks located in states other than its home state without regard to state law, subject to certain conditions, including the condition that the BHC, after and as a result of the acquisition, controls no more than 10 percent of the total amount of deposits of insured depository institutions in the U.S. and no more than 30 percent or such lesser or greater amount set by state law of such deposits in that state. At June 30, 2018, we held greater than 10 percent of the total amount of deposits of insured depository institutions in the U.S.

In addition, the Financial Reform Act restricts acquisitions by a financial institution if, as a result of the acquisition, the total liabilities of the financial institution would exceed 10 percent of the total liabilities of all financial institutions in the U.S. At June 30, 2018, our liabilities did not exceed 10 percent of the total liabilities of all financial institutions in the U.S.

The Volcker Rule

The Volcker Rule prohibits insured depository institutions and companies affiliated with insured depository institutions (collectively, banking entities) from engaging in short-term proprietary trading of certain securities, derivatives, commodity futures and options for their own account. The Volcker Rule also imposes limits on banking entities' investments in, and other relationships with, hedge funds and private equity funds. The Volcker Rule provides exemptions for certain activities, including market-making, underwriting, hedging, trading in government obligations, insurance company activities and organizing and offering hedge funds and private equity funds. The Volcker Rule also clarifies that certain activities are not prohibited, including acting as agent, broker or custodian. A banking entity with significant trading operations, such as the Corporation, is required to maintain a detailed compliance program to comply with the restrictions of the Volcker Rule.

Derivatives

Our derivatives operations are subject to extensive regulation globally. These operations are subject to regulation under the Financial Reform Act, the European Union (EU) Markets in Financial Instruments Directive and Regulation, the European Market Infrastructure Regulation and similar regulatory regimes in other jurisdictions, that regulate or will regulate the derivatives markets in which we operate by, among other things: requiring clearing and exchange trading of certain derivatives; imposing new capital, margin, reporting, registration and business conduct requirements for certain market participants; imposing position limits on certain over-the-counter (OTC) derivatives; and imposing derivatives trading transparency requirements. Regulations of derivatives are already in effect in many markets in which we operate.

In addition, many G-20 jurisdictions, including the U.S., U.K., Germany and Japan, have adopted resolution stay regulations to address concerns that the close-out of derivatives and other financial contracts in resolution could impede orderly resolution of global systemically important banks (G-SIBs), and additional jurisdictions are expected to follow suit. We and 24 other G-SIBs have adhered to a protocol amending certain financial contracts to provide for contractual recognition of stays of termination rights under various statutory resolution regimes and a stay on the exercise of cross-default rights based on an affiliate's entry into U.S. bankruptcy proceedings. As resolution stay regulations of a particular jurisdiction go into effect, we amend financial contracts in compliance with such regulations.

Consumer Regulations

Our consumer businesses are subject to extensive regulation and oversight by federal and state regulators. Certain federal consumer finance laws to which we are subject, including the Equal Credit Opportunity Act, Home Mortgage Disclosure Act, Electronic Fund

Transfer Act, Fair Credit Reporting Act, Real Estate Settlement Procedures Act, Truth in Lending Act and Truth in Savings Act, are enforced by the CFPB. Other federal consumer finance laws, such as the Servicemembers Civil Relief Act, are enforced by the OCC.

Privacy and Information Security

We are subject to many U.S. federal, state and international laws and regulations governing requirements for maintaining policies and procedures to protect the non-public confidential information of our customers and employees. The Gramm-Leach-Bliley Act requires us to periodically disclose Bank of America's privacy policies and practices relating to sharing such information and enables retail customers to opt out of our ability to share information with unaffiliated third parties, under certain circumstances. Other laws and regulations, at the international, federal and state level, impact our ability to share certain information with affiliates and non-affiliates for marketing and/or non-marketing purposes, or to contact customers with marketing offers, including California's consumer privacy law that established basic rights of consumers in connection with their personal information. The Gramm-Leach-Bliley Act also requires us to implement a comprehensive information security program that includes administrative, technical and physical safeguards to provide the security and confidentiality of customer records and information. These security and privacy policies and procedures for the protection of personal and confidential information are in effect across all businesses and geographic locations. In the EU, the General Data Protection Regulation (GDPR) replaced the Data Protection Directive and related implementing national laws in its member states. The GDPR's impact on the Corporation was assessed and addressed through a comprehensive compliance implementation program. Additionally, other legislative and regulatory activity in the U.S. and abroad, as well as court proceedings and bilateral U.S. and EU political developments on the validity of cross-border data transfer mechanisms from the EU, continue to lend uncertainty to privacy compliance globally.

Item 1A. Risk Factors

In the course of conducting our business operations, we are exposed to a variety of risks, some of which are inherent in the financial services industry and others of which are more specific to our own businesses. The discussion below addresses the most significant factors, of which we are currently aware, that could affect our businesses, results of operations and financial condition. Additional factors that could affect our businesses, results of operations and financial condition are discussed in Forward-looking Statements in the MD&A on page 20. However, other factors not discussed below or elsewhere in this Annual Report on Form 10-K could also adversely affect our businesses, results of operations and financial condition. Therefore, the risk factors below should not be considered a complete list of potential risks that we may face. For more information on how we manage risks, see Managing Risk in the MD&A on page 40.

Any risk factor described in this Annual Report on Form 10-K or in any of our other SEC filings could by itself, or together with other factors, materially adversely affect our liquidity, competitive position, business, reputation, results of operations, capital position or financial condition, including by materially increasing our expenses or decreasing our revenues, which could result in material losses.

Market

Our business and results of operations may be adversely affected by the U.S. and international financial markets, U.S. and non-U.S. fiscal and monetary policies and economic conditions generally.

Financial markets and general economic, political and social conditions in the U.S. and in one or more countries abroad, including the level and volatility of interest rates, unexpected changes in market financing conditions, gross domestic product (GDP) growth, inflation, consumer spending, employment levels, wage stagnation, prolonged federal government shutdowns, energy prices, home prices, bankruptcies, fluctuations or other significant changes in both debt and equity capital markets and currencies, liquidity of the global financial markets, the growth of global trade and commerce, trade policies, the availability and cost of capital and credit, terrorism, disruption of communication, transportation or energy infrastructure, investor sentiment and confidence, the sustainability of economic growth and any potential slowdown in economic activity may affect markets in the U.S. and abroad and our businesses. Any market downturn in the U.S. or abroad would likely result in a decline in revenue and adversely affect our results of operations and financial condition, including capital and liquidity levels.

In the U.S. and abroad, uncertainties surrounding fiscal and monetary policies present economic challenges. Actions taken by the Federal Reserve, including potential further increases in its target funds rate and the ongoing reduction in its balance sheet, and other central banks are beyond our control and difficult to predict and can affect interest rates and the value of financial instruments and other assets, such as debt securities and mortgage servicing rights (MSRs) and impact our borrowers, potentially increasing delinquency and default rates as interest rates rise.

Changes to existing U.S. laws and regulatory policies including those related to financial regulation, taxation, international trade, fiscal policy and healthcare may adversely impact us. For example, significant fiscal policy initiatives may increase uncertainty surrounding the formulation and direction of U.S. monetary policy, and volatility of interest rates. Higher U.S. interest rates relative to other major economies could increase the likelihood of a more volatile and appreciating U.S. dollar. Changes, or proposed changes to certain U.S. trade policies, particularly with important trading partners, including China, could upset financial markets, disrupt world trade and commerce and lead to trade retaliation through the use of tariffs, foreign exchange measures or the large-scale sale of U.S. Treasury Bonds.

Any of these developments could adversely affect our consumer and commercial businesses, our securities and derivatives portfolios, our level of charge-offs and provision for credit losses, the carrying value of our deferred tax assets, our capital levels and liquidity and the costs of running our business, and our results of operations. Additionally, events and ongoing uncertainty related to the planned exit of the U.K. from the EU could magnify any negative impact of these developments on our business and results of operations.

Increased market volatility and adverse changes in other financial or capital market conditions may increase our market risk.

Our liquidity, competitive position, business, results of operations and financial condition are affected by market risks such as changes in interest and currency exchange rates, fluctuations in equity and futures prices, lower trading volumes and prices of securitized products, the implied volatility of interest rates and credit spreads and other economic and business factors. These market risks may adversely affect, among other things, (i) the value of our on- and off-balance sheet securities, trading assets, other financial instruments and MSRs, (ii) the cost of debt capital and our access to credit markets, (iii) the value of assets under management (AUM), (iv) fee income relating to AUM, (v) customer allocation of capital among investment alternatives, (vi) the volume of client activity in our trading operations, (vii) investment banking fees, (viii) the general profitability and risk level of the transactions in which we engage and (ix) our competitiveness with respect to deposit pricing. For example, the value of certain of our assets is sensitive to changes in market interest rates. If the Federal Reserve or a non-U.S. central bank changes or signals a change in monetary policy, market interest rates could be affected, which could adversely impact the value of such assets. In addition, the low but rising interest rate environment and recent flattening of the yield curve could negatively impact our liquidity, financial condition or results of operations, including future revenue and earnings growth.

We use various models and strategies to assess and control our market risk exposures but those are subject to inherent limitations. For more information regarding models and strategies, see Item 1A. Risk Factors – Other on page 16. In times of market stress or other unforeseen circumstances, previously uncorrelated indicators may become correlated and vice versa. These types of market movements may limit the effectiveness of our hedging strategies and cause us to incur significant losses. These changes in correlation can be exacerbated where other market participants are using risk or trading models with assumptions or algorithms similar to ours. In these and other cases, it may be difficult to reduce our risk positions due to activity of other market participants or widespread market dislocations, including circumstances where asset values are declining significantly or no market exists for certain assets. To the extent that we own securities that do not have an established liquid trading market or are otherwise subject to restrictions on sale or hedging, we may not be able to reduce our positions and therefore reduce our risk associated with such positions. In addition, challenging market conditions may also adversely affect our investment banking fees.

For more information about market risk and our market risk management policies and procedures, see Market Risk Management in the MD&A on page 70.

We may incur losses if the value of certain assets declines, including due to changes in interest rates and prepayment speeds.

We have a large portfolio of financial instruments, including certain loans and loan commitments, loans held-for-sale, securities financing agreements, asset-backed secured financings, long-term deposits, long-term debt, trading account assets and liabilities, derivative assets and liabilities, available-for-sale (AFS) debt and marketable equity securities, other debt securities, equity method investments, certain MSRs and certain other assets and liabilities that we measure at fair value and other accounting values, subject to impairment assessments. We determine these values based on applicable accounting guidance, which for financial instruments measured at fair value, requires an entity to base fair value on exit price and to maximize the use of observable inputs and minimize the use of unobservable inputs in fair value measurements. The fair values of these financial instruments include adjustments for market liquidity, credit quality, funding impact on certain derivatives and other transaction-specific factors, where appropriate.

Gains or losses on these instruments can have a direct impact on our results of operations, including higher or lower mortgage banking income and earnings, unless we have effectively hedged our exposures. For example, decreases in interest rates and increases in mortgage prepayment speeds, which are influenced by interest rates and other factors such as reductions in mortgage insurance premiums and origination costs, could adversely impact the value of our MSR asset, and cause a significant acceleration of purchase premium amortization on our mortgage portfolio, because a decline in long-term interest rates shortens the expected lives of the securities, and adversely affects our net interest margin. Conversely, increases in interest rates may result in a decrease in residential mortgage loan originations. In addition, increases in interest rates may adversely impact the fair value of debt securities and, accordingly, for debt securities classified as AFS, may adversely affect accumulated other comprehensive income and, thus, capital levels.

Fair values may be impacted by declining values of the underlying assets or the prices at which observable market transactions occur and the continued availability of these transactions. The financial strength of counterparties, with whom we have economically hedged some of our exposure to these assets, also will affect the fair value of these assets. Sudden declines and volatility in the prices of assets may curtail or eliminate trading activities in these assets, which may make it difficult to sell, hedge or value these assets. The inability to sell or effectively hedge assets reduces our ability to limit losses in such positions and the difficulty in valuing assets may increase our risk-weighted assets, which requires us to maintain additional capital and increases our funding costs. Asset values also directly impact revenues in our wealth management and related advisory businesses. We receive asset-based management fees based on the value of our clients' portfolios or investments in funds managed by us and, in some cases, we also receive performance fees based on increases in the value of such investments. Declines in asset values can reduce the value of our clients' portfolios or fund assets, which in turn can result in lower fees earned for managing such assets.

For more information on fair value measurements, see *Note 20 – Fair Value Measurements* to the Consolidated Financial Statements. For more information on our asset management businesses, see *GWIM* in the MD&A on page

33. For more information on interest rate risk management, see Interest Rate Risk Management for the Banking Book in the MD&A on page 74.

Liquidity

If we are unable to access the capital markets, continue to maintain deposits, or our borrowing costs increase, our liquidity and competitive position will be negatively affected.

Liquidity is essential to our businesses. We fund our assets primarily with globally sourced deposits in our bank entities, as well as secured and unsecured liabilities transacted in the capital markets. We rely on certain secured funding sources, such as repo markets, which are typically short-term and credit-sensitive in nature. We also engage in asset securitization transactions, including with the government-sponsored enterprises (GSEs), to fund consumer lending activities. Our liquidity could be adversely affected by any inability to access the capital markets; illiquidity or volatility in the capital markets; the decrease in value of eligible collateral or increased collateral requirements due to credit concerns for short-term borrowing; changes to our relationships with our funding providers based on real or perceived changes in our risk profile; prolonged federal government shutdowns; changes in regulations, guidance or GSE status that impact our funding avenues or ability to access certain funding sources; the refusal or inability of the Federal Reserve to act as lender of last resort; simultaneous draws on lines of credit; the withdrawal of customer deposits, which could result from customer attrition for higher yields or the desire for more conservative alternatives; increased regulatory liquidity, capital and margin requirements for our U.S. or international banks and their nonbank subsidiaries; failure by a significant market participant or third party, such as a clearing agent or custodian; reputational issues; or negative perceptions about our short- or long-term business prospects, including downgrades of our credit ratings. Several of these factors may arise due to circumstances beyond our control, such as general market volatility, disruption, shock or stress, fluctuations in interest rates, negative views about the Corporation or financial services industry generally or a specific news event, changes in the regulatory environment, actions by credit rating agencies or an operational problem that affects third parties or us. The impact of these events, whether within our control or not, could include an inability to sell assets or redeem investments, unforeseen outflows of cash, the need to draw on liquidity facilities, debt repurchases to support the secondary market or meet client requests, the need for additional funding for commitments and contingencies, as well as unexpected collateral calls, among other things, the result of which could be a liquidity shortfall and/or impact on our liquidity coverage ratio.

Our cost of obtaining funding is directly related to prevailing market interest rates and to our credit spreads. Credit spreads are the amount in excess of the interest rate of U.S. Treasury securities, or other benchmark securities, of a similar maturity that we need to pay to our funding providers. Increases in interest rates and our credit spreads can increase the cost of our funding and result in mark-to-market or credit valuation adjustment exposures. Changes in our credit spreads are market-driven and may be influenced by market perceptions of our creditworthiness. Changes to interest rates and our credit spreads occur continuously and may be unpredictable and highly volatile. Additionally, concentrations within our funding profile, such as maturities, currencies or counterparties, can reduce our funding efficiency.

For more information about our liquidity position and other liquidity matters, including credit ratings and outlooks and the policies and procedures we use to manage our liquidity risks, see Liquidity Risk in the MD&A on page 47.

Adverse changes to our credit ratings from the major credit rating agencies could significantly limit our access to funding or the capital markets, increase our borrowing costs or trigger additional collateral or funding requirements.

Our borrowing costs and ability to raise funds are directly impacted by our credit ratings. In addition, credit ratings may be important to customers or counterparties when we compete in certain markets and seek to engage in certain transactions, including OTC derivatives. Credit ratings and outlooks are opinions expressed by rating agencies on our creditworthiness and that of our obligations or securities, including long-term debt, short-term borrowings, preferred stock and asset securitizations. Our credit ratings are subject to ongoing review by rating agencies, which consider a number of factors, including our own financial strength, performance, prospects and operations as well as factors not under our control such as the likelihood of the U.S. government providing meaningful support to us or our subsidiaries in a crisis.

Rating agencies could make adjustments to our credit ratings at any time, and there can be no assurance as to when and whether downgrades will occur. A reduction in certain of our credit ratings could result in a wider credit spread and negatively affect our liquidity, access to credit markets, the related cost of funds, our businesses and certain trading revenues, particularly in those businesses where counterparty creditworthiness is critical. If the short-term credit ratings of our parent company, bank or broker-dealer subsidiaries were downgraded by one or more levels, we may suffer the potential loss of access to short-term funding sources such as repo financing, and/or increased cost of funds. Under the terms of certain OTC derivative contracts and other trading agreements, if our or our subsidiaries' credit ratings are downgraded, the counterparties may require additional collateral or terminate these contracts or agreements.

While certain potential impacts are contractual and quantifiable, the full consequences of a credit rating downgrade to a financial institution are inherently uncertain, as they depend upon numerous dynamic, complex and inter-related factors and assumptions, including whether any downgrade of a firm's long-term credit ratings precipitates downgrades to its short-term credit ratings, and assumptions about the potential behaviors of various customers, investors and counterparties.

For more information on the amount of additional collateral required and derivative liabilities that would be subject to unilateral termination at December 31, 2018, if the rating agencies had downgraded their long-term senior debt ratings for the Corporation or certain subsidiaries by each of two incremental notches, see Credit-related Contingent Features and Collateral in *Note 3 – Derivatives* to the Consolidated Financial Statements.

For more information about our credit ratings and their potential effects to our liquidity, see Liquidity Risk – Credit Ratings in the MD&A on page 50 and *Note 3 – Derivatives* to the Consolidated Financial Statements.

Bank of America Corporation is a holding company and we depend upon our subsidiaries for liquidity, including the ability to pay dividends to shareholders and to fund payments on other obligations. Applicable laws and regulations, including capital and liquidity requirements, and actions taken pursuant to our resolution plan could restrict our ability to transfer funds from subsidiaries to Bank of America Corporation or to other subsidiaries, which could adversely affect our cash flow and financial condition.

Bank of America Corporation, as the parent company, is a separate and distinct legal entity from our banking and nonbank subsidiaries. We evaluate and manage liquidity on a legal entity basis. Legal entity liquidity is an important consideration as there are legal, regulatory, contractual and other limitations on our ability to utilize liquidity from one legal entity to satisfy the liquidity requirements of another, including the parent company, which could result in adverse liquidity events. The parent company depends on dividends, distributions, loans, advances and other payments from our banking and nonbank subsidiaries to fund dividend payments on our common stock and preferred stock and to fund all payments on our other obligations, including debt obligations. Many of our subsidiaries, including our bank and broker-dealer subsidiaries, are subject to laws that restrict dividend payments, or authorize regulatory bodies to block or reduce the flow of funds from those subsidiaries to the parent company or other subsidiaries. Our bank and broker-dealer subsidiaries are subject to restrictions on their ability to lend or transact with affiliates and to minimum regulatory capital and liquidity requirements, as well as restrictions on their ability to use funds deposited with them in bank or brokerage accounts to fund their businesses. Intercompany arrangements we entered into in connection with our resolution planning submissions could restrict the amount of funding available to the parent company from our subsidiaries under certain adverse conditions.

Additional restrictions on related party transactions, increased capital and liquidity requirements and additional limitations on the use of funds on deposit in bank or brokerage accounts, as well as lower earnings, can reduce the amount of funds available to meet the obligations of the parent company and even require the parent company to provide additional funding to such subsidiaries. Also, regulatory action that requires additional liquidity at each of our subsidiaries could impede access to funds we need to pay our obligations or pay dividends. In addition, our right to participate in a distribution of assets upon a subsidiary’s liquidation or reorganization is subject to prior claims of the subsidiary’s creditors. For more information regarding our ability to pay dividends, seeCapital Management in the MD&A on page 43 and *Note 13 – Shareholders’ Equity*to the Consolidated Financial Statements.

In the event of a resolution, whether in a bankruptcy proceeding or under the orderly liquidation authority of the FDIC, such resolution could materially adversely affect our liquidity and financial condition and the ability to pay dividends to shareholders and to pay obligations.

Bank of America Corporation, our parent holding company, is required to periodically submit a plan to the FDIC and Federal Reserve describing its resolution strategy under the U.S. Bankruptcy Code in the event of material financial distress or failure. In the current plan, Bank of America Corporation's preferred resolution strategy is a "single point of entry" strategy. This strategy provides that only the parent holding company files for resolution under the U.S. Bankruptcy Code and contemplates providing certain key operating subsidiaries with sufficient capital and liquidity to operate through severe stress and to enable such subsidiaries to continue operating or be wound down in a solvent manner following a bankruptcy of the parent holding company. Bank of America Corporation has entered into intercompany arrangements resulting in the contribution of most of its capital and liquidity to key subsidiaries. Pursuant to these arrangements, if Bank of America Corporation's liquidity resources deteriorate so severely that resolution becomes imminent, Bank of America Corporation will no longer be able to draw liquidity from its key subsidiaries, and will be required to contribute its remaining financial assets to a wholly-owned holding company subsidiary, which could materially and adversely affect our liquidity and financial condition and the ability to pay dividends to shareholders and meet our payment obligations.

In addition, if the FDIC and Federal Reserve jointly determine that Bank of America Corporation's resolution plan is not credible, they could impose more stringent capital, leverage or liquidity requirements or restrictions on our growth, activities or operations. Further, we could be required to take certain actions that could impose operating costs and could potentially result in the divestiture or restructuring of certain businesses and subsidiaries.

Under the Financial Reform Act, when a G-SIB such as Bank of America Corporation is in default or danger of default, the FDIC may be appointed receiver in order to conduct an orderly liquidation of such institution. In the event of such appointment, the FDIC could, among other things, invoke the orderly liquidation authority, instead of the U.S. Bankruptcy Code, if the Secretary of the Treasury makes certain financial distress and systemic risk determinations. In 2013, the FDIC issued a notice describing its preferred "single point of entry" strategy for resolving a G-SIB. Under this approach, the FDIC could replace Bank of America Corporation with a bridge holding company, which could continue operations and result in an orderly resolution of the underlying bank, but whose equity would be held solely for the benefit of our creditors. The FDIC's "single point of entry" strategy may result in our security holders suffering greater losses than would have been the case under a bankruptcy proceeding or a different resolution strategy.

For more information about resolution planning, see Item 1. Business – Resolution Planning on page 3. For more information about the FDIC's orderly liquidation, see Item 1. Business – Insolvency and the Orderly Liquidation Authority on page 4.

Credit

Economic or market disruptions, insufficient credit loss reserves or concentration of credit risk may result in an increase in the provision for credit losses, which could have an adverse effect on our financial condition and results of operations.

A number of our products expose us to credit risk, including loans, letters of credit, derivatives, debt securities, trading account assets and assets held-for-sale. The financial condition of our

consumer and commercial borrowers, counterparties and underlying collateral could adversely affect our financial condition and results of operations.

Global and U.S. economic conditions and macroeconomic events, including a decline in global GDP, consumer spending or real estate prices, as well as increasing leverage, rising unemployment and/or fluctuations in foreign exchange or interest rates, particularly if inflation is rising, may impact our credit portfolios. Economic or market stress or disruptions, including as a result of natural disasters, would likely increase the risk that borrowers or counterparties would default or become delinquent in their obligations to us, resulting in credit loss. Increases in delinquencies and default rates could adversely affect our consumer credit card, home equity, residential mortgage and purchased credit-impaired portfolios through increased charge-offs and provision for credit losses. A deteriorating economic environment could also adversely affect our consumer and commercial loan portfolios with weakened client and collateral positions. Additionally, simultaneous drawdowns on lines of credit or an increase in a borrower's leverage in a weakening economic environment could result in deterioration in our credit portfolio, should borrowers be unable to fulfill competing financial obligations. Specifically, our consumer portfolio could be negatively impacted by drastic reductions in employment, or increases in underemployment, resulting in lower disposable income.

We estimate and establish an allowance for credit losses for losses inherent in our lending activities (including unfunded lending commitments), excluding those measured at fair value, through a charge to earnings. The process for determining the amount of the allowance requires us to make difficult and complex judgments, including loss forecasts on how borrowers will react to changing economic conditions. The ability of our borrowers or counterparties to repay their obligations will likely be impacted by changes in future economic conditions, which in turn could impact the accuracy of our loss forecasts and allowance estimates. There is also the possibility that we will fail to accurately identify the appropriate economic indicators or that we will fail to accurately estimate their impacts.

We may suffer unexpected losses if the models and assumptions we use to establish reserves and make judgments in extending credit to our borrowers or counterparties prove inaccurate in predicting future events. In addition, external factors, such as natural disasters, can influence recognition of credit losses in our portfolios and impact our allowance for credit losses. Although we believe that our allowance for credit losses was in compliance with applicable accounting standards at December 31, 2018, there is no guarantee that it will be sufficient to address credit losses, particularly if economic conditions deteriorate. In such an event, we may increase the size of our allowance which would reduce our earnings.

In the ordinary course of our business, we also may be subject to a concentration of credit risk in a particular industry, geographic location, counterparty, borrower or issuer. A deterioration in the financial condition or prospects of a particular industry or a failure or downgrade of, or default by, any particular entity or group of entities could negatively affect our businesses, and the processes by which we set limits and monitor the level of our credit exposure to individual entities, industries and countries may not function as we have anticipated. While our activities expose us to many different industries and counterparties, we routinely execute a high volume of transactions with counterparties in the financial services industry, including broker-dealers, commercial banks, investment banks, insurers, mutual funds and hedge funds, and other institutional clients. This has resulted in significant credit concentration with respect to this industry. Financial services institutions and other counterparties are inter-related because of trading, funding, clearing or other relationships. As a result, defaults by, or even market uncertainty about the financial stability of one or more financial services institutions, or the financial services industry generally, could lead to market-wide liquidity disruptions, losses and defaults. Many of these transactions expose us to credit risk and, in some cases, disputes and litigation in the event of default of a counterparty. In addition, our credit risk may be heightened by market risk when the collateral held by us cannot be liquidated or is liquidated at prices not sufficient to recover the full amount of the loan or derivatives exposure due to us. Further, disputes with obligors as to the valuation of collateral could increase in times of significant market stress, volatility or illiquidity, and we could suffer losses during such periods if we are unable to realize the fair value of the collateral or manage declines in the value of collateral.

In the ordinary course of business, we also enter into transactions with sovereign nations, U.S. states and U.S. municipalities. Unfavorable economic or political conditions, disruptions to capital markets, currency fluctuations, changes in oil prices, social instability and changes in government policies could impact the operating budgets or credit ratings of these government entities and expose us to credit risk.

We also have a concentration of credit risk with respect to our consumer real estate, auto, consumer credit card and commercial real estate portfolios, which represent a significant percentage of our overall credit portfolio. Additionally, decreases in home price valuations or commercial real estate valuations in certain markets where we have large concentrations, including as a result of natural disasters, as well as more broadly within the U.S. or globally, could result in increased defaults, delinquencies or credit loss. For more information, see Consumer Portfolio Credit Risk Management in the MD&A on page 51. Furthermore, our commercial portfolios include exposures to certain industries, including the energy sector. For more information, see Commercial Portfolio Credit Risk Management in the MD&A on page 59. Economic weaknesses, adverse business conditions, market disruptions, rising interest or capitalization rates, the collapse of speculative bubbles, greater volatility in areas where we have concentrated credit risk or deterioration in real estate values or household incomes may cause us to experience a decrease in cash flow and higher credit losses in either our consumer or commercial portfolios or cause us to write down the value of certain assets.

Liquidity disruptions in the financial markets may result in our inability to sell, syndicate or realize the value of our positions, leading to increased concentrations, which could increase the credit and market risk associated with our positions, as well as increase our risk-weighted assets.

For more information about our credit risk and credit risk management policies and procedures, see Credit Risk Management in the MD&A on page 51, *Note 1 – Summary of Significant Accounting Principles*, *Note 5 – Outstanding Loans and Leases* and *Note 6 – Allowance for Credit Losses* to the Consolidated Financial Statements.

If the U.S. housing market weakens or home prices decline, our consumer loan portfolios, credit quality, credit losses, representations and warranties exposures and earnings may be adversely affected.

While U.S. home prices continued to generally improve during 2018, declines in future periods may negatively impact the demand for many of our products. Additionally, our mortgage loan production volume is generally influenced by the rate of growth in residential mortgage debt outstanding and the size of the residential mortgage market, both of which may be adversely

affected by rising interest rates. Conditions in the U.S. housing market in prior years resulted in both significant write-downs of asset values in several asset classes, notably mortgage-backed securities, and exposure to monolines. If the U.S. housing market were to weaken, the value of real estate could decline, which could result in increased credit losses and delinquent servicing expenses and negatively affect our representations and warranties exposures, which could have an adverse effect on our financial condition and results of operations.

Our derivatives businesses may expose us to unexpected risks and potential losses.

We are party to a large number of derivatives transactions, including credit derivatives. Our derivatives businesses may expose us to unexpected market, credit and operational risks that could cause us to suffer unexpected losses. Severe declines in asset values, unanticipated credit events or unforeseen circumstances that may cause previously uncorrelated factors to become correlated and vice versa, may create losses resulting from risks not appropriately taken into account or anticipated in the development, structuring or pricing of a derivative instrument. Certain of our OTC derivative contracts and other trading agreements provide that upon the occurrence of certain specified events, such as a change in the credit rating of a particular Bank of America entity or entities, we may be required to provide additional collateral or take other remedial actions, or our counterparties may have the right to terminate or otherwise diminish our rights under these contracts or agreements.

In addition, in the event of a downgrade of our credit ratings, certain derivative and other counterparties may request we substitute BANA (which has generally had equal or higher credit ratings than the parent company) as counterparty for certain contracts. Our ability to substitute or make changes to these agreements may be subject to certain limitations including, counterparty willingness, operational considerations, regulatory limitations on having BANA as a counterparty and collateral constraints. It is possible that such limitations on our ability to substitute or make changes to these agreements, including having BANA as the new counterparty, could adversely affect our results of operations.

Many derivative instruments are individually negotiated and non-standardized, which can make exiting, transferring or settling some positions difficult. Many derivatives require that we deliver to the counterparty the underlying security, loan or other obligation in order to receive payment. In a number of cases, we do not hold, and may not be able to obtain, the underlying security, loan or other obligation.

We are also a member of various central counterparty clearinghouses (CCPs) due to regulatory requirements for mandatory clearing of derivative transactions, which potentially increases our credit risk exposures to CCPs. In the event that one or more members of the CCP defaults on its obligations, we may be required to pay a portion of any losses incurred by the CCP as a result of that default. Also, as a clearing member, we are exposed to the risk of non-performance by our clients for which we clear transactions, which may not be covered by available collateral.

For more information on our derivatives exposure, see *Note 3 – Derivatives* to the Consolidated Financial Statements.

Geopolitical

We are subject to numerous political, economic, market, reputational, operational, legal, regulatory and other risks in the jurisdictions in which we operate.

We do business throughout the world, including in emerging markets. Our businesses and revenues derived from non-U.S. jurisdictions are subject to risk of loss from currency fluctuations, financial, social or judicial instability, changes in governmental policies or policies of central banks, expropriation, nationalization and/or confiscation of assets, price controls, capital controls, redenomination risk, exchange controls, protectionist trade policies, increasing trade tensions between the U.S. and important trading partners, particularly China, increasing the risk of escalating tariffs and other restrictive actions, unfavorable political and diplomatic developments, oil price fluctuation and changes in legislation. These risks are especially elevated in emerging markets. A number of non-U.S. jurisdictions in which we do business have been or may be negatively impacted by slowing growth or recessionary conditions, market volatility and/or political unrest. The political and economic environment in Europe, including the debt concerns of certain EU countries, remains challenging and the current degree of political and economic uncertainty, including potential recessionary conditions, could increase. For example, the ongoing negotiations of the terms of the U.K.'s planned exit from the EU may create uncertainty and increase risk, which could adversely affect us.

Potential risks of default on or devaluation of sovereign debt in some non-U.S. jurisdictions could expose us to substantial losses. Risks in one nation can limit our opportunities for portfolio growth and negatively affect our operations in other nations, including our U.S. operations. Market and economic disruptions of all types may affect consumer confidence levels and spending, corporate investment and job creation, bankruptcy rates, levels of incurrence and default on consumer and corporate debt, economic growth rates and asset values, among other factors. Any such unfavorable conditions or developments could have an adverse impact on our company.

We also invest or trade in the securities of corporations and governments located in non-U.S. jurisdictions, including emerging markets. Revenues from the trading of non-U.S. securities may be subject to negative fluctuations as a result of the above factors. Furthermore, the impact of these fluctuations could be magnified because non-U.S. trading markets, particularly in emerging markets, are generally smaller, less liquid and more volatile than U.S. trading markets.

Our non-U.S. businesses are also subject to extensive regulation by governments, securities exchanges and regulators, central banks and other regulatory bodies. In many countries, the laws and regulations applicable to the financial services and securities industries are uncertain and evolving, and it may be difficult for us to determine the exact requirements of local laws in every market or manage our relationships with multiple regulators in various jurisdictions. Our potential inability to remain in compliance with local laws in a particular market and manage our relationships with regulators could have an adverse effect not only on our businesses in that market but also on our reputation in general.

In addition to non-U.S. legislation, our international operations are also subject to U.S. legal requirements. For example, our operations are subject to U.S. and non-U.S. laws and regulations relating to bribery and corruption, anti-money laundering, and economic sanctions, which can vary by jurisdiction. The increasing speed and novel ways in which funds circulate could make it more challenging to track the movement of funds. Our ability to comply with these legal requirements depends on our ability to continually improve detection and reporting and analytic capabilities.

In the U.S., debt ceiling and budget deficit concerns, which have increased the possibility of U.S. government defaults on its debt and/or downgrades to its credit ratings, and prolonged government shutdowns could negatively impact the global economy and banking system and adversely affect our financial condition, including our liquidity. Additionally, changes in fiscal,

monetary or regulatory policy could increase our compliance costs and adversely affect our business operations, organizational structure and results of operations. We are also subject to geopolitical risks, including acts or threats of terrorism, and actions taken by the U.S. or other governments in response thereto, and/or military conflicts, which could adversely affect business and economic conditions abroad, as well as in the U.S.

For more information on our non-U.S. credit and trading portfolios, see Non-U.S. Portfolio in the MD&A on page 65.

The U.K. Referendum, and the planned exit of the U.K. from the EU, could adversely affect us.

We conduct business in Europe, the Middle East and Africa primarily through our subsidiaries in the U.K. and Ireland. For the year ended December 31, 2018, our operations in Europe, the Middle East and Africa, including the U.K., represented approximately six percent of our total revenue, net of interest expense.

A referendum was held in the U.K. in 2016, which resulted in a majority vote in favor of exiting the EU on March 29, 2019. Negotiations between the EU and U.K. regarding this exit consist of three phases: a withdrawal agreement, a new trade deal and an arrangement for a transition period. Significant political and economic uncertainty persists regarding the timing, details and viability of each phase. There may be heightened uncertainty if the terms of the U.K.'s exit from the EU are not agreed upon at the time of its exit. The ultimate impact and terms of the U.K.'s planned exit remain unclear, and short- and long-term global economic and market volatility may occur, including as a result of currency fluctuations and trade relations. If uncertainty resulting from the U.K.'s exit negatively impacts economic conditions, financial markets and consumer confidence, our business, results of operations, financial position and/or operational model could be adversely affected.

We are also subject to different laws, regulations and regulatory authorities and may incur additional costs and/or experience negative tax consequences as a result of establishing our principal EU banking and broker-dealer operations outside of the U.K., which could adversely impact our EU business, results of operations and operational model. Additionally, changes to the legal and regulatory framework under which our subsidiaries will continue to provide products and services in the U.K. following an exit by the U.K. from the EU may result in additional compliance costs and have an adverse impact on our results of operations. For more information on our EU operations outside of the U.K., see Executive Summary – Recent Developments – U.K. Exit from the EU in the MD&A on page 21.

Business Operations

A failure in or breach of our operational or security systems or infrastructure, or those of third parties, could disrupt our businesses, and adversely impact our results of operations, liquidity and financial condition, as well as cause legal or reputational harm.

The potential for operational risk exposure exists throughout our organization and, as a result of our interactions with, and reliance on, third parties, is not limited to our own internal operational functions. Our operational and security systems infrastructure, including our computer systems, emerging technologies, data management and internal processes, as well as those of third parties, are integral to our performance. We rely on our employees and third parties in our day-to-day and ongoing operations, who may, as a result of human error, misconduct, malfeasance or failure or breach of systems or infrastructure, expose us to risk. We have taken measures to implement training, procedures, backup systems and other safeguards to support our operations, but our ability to conduct business may be adversely affected by any significant disruptions to us or to third parties with whom we interact or upon whom we rely. For example, technology project implementation challenges may cause business interruptions. In addition, our ability to implement backup systems and other safeguards with respect to third-party systems is more limited than with respect to our own systems. Our financial, accounting, data processing, backup or other operating or security systems and infrastructure or those of third parties with whom we interact or upon whom we rely may fail to operate properly or become disabled or damaged as a result of a number of factors including events that are wholly or partially beyond our or such third party's control, which could adversely affect our ability to process transactions or provide services. There could be sudden increases in customer transaction volume due to electronic trading platforms and algorithmic trading applications; electrical, telecommunications or other major physical infrastructure outages; newly identified vulnerabilities in key hardware or software; natural disasters such as earthquakes, tornadoes, hurricanes and floods; pandemics; and events arising from local or larger scale political or social matters, including terrorist acts, which could result in prolonged operational outages. In the event that backup systems are utilized, they may not process data as quickly as our primary systems and some data might not have been backed up. We continuously update the systems on which we rely to support our operations and growth and to remain compliant with all applicable laws, rules and regulations globally. This updating entails significant costs and creates risks associated with implementing new systems and integrating them with existing ones, including business interruptions. Operational risk exposures could adversely impact our results of operations, liquidity and financial condition, as well as cause reputational harm.

A cyber-attack, information or security breach, or a technology failure of ours or of a third party could adversely affect our ability to conduct our business, manage our exposure to risk or expand our businesses, result in the disclosure or misuse of confidential or proprietary information, increase our costs to maintain and update our operational and security systems and infrastructure, and adversely impact our results of operations, liquidity and financial condition, as well as cause legal or reputational harm.

Our businesses are highly dependent on the security, controls and efficacy of our infrastructure, computer and data management systems, as well as those of our customers, suppliers, counterparties and other third parties with whom we interact or on whom we rely. Our businesses rely on effective access management and the secure collection, processing, transmission, storage and retrieval of confidential, proprietary, personal and other information in our computer and data management systems and networks, and in the computer and data management systems and networks of third parties. In addition, to access our network, products and services, our employees, customers, suppliers, counterparties and other third parties increasingly use personal mobile devices or computing devices that are outside of our network and control environments and are subject to their own cybersecurity risks.

We, our employees and customers, regulators and other third parties have been subject to, and are likely to continue to be the target of, cyber-attacks. These cyber-attacks include computer viruses, malicious or destructive code (such as ransomware), phishing attacks, denial of service or information or other security breaches that could result in the unauthorized release, gathering, monitoring, misuse, loss or destruction of confidential, proprietary and other information of ours, our employees, our customers or of third parties, damages to systems, or otherwise material disruption to our or our customers' or other third parties' network

access or business operations. As cyber threats continue to evolve, we may be required to expend significant additional resources to continue to modify or enhance our protective measures or to investigate and remediate any information security vulnerabilities or incidents. Cyber threats are rapidly evolving, and despite substantial efforts to protect the integrity of our systems and implement controls, processes, policies and other protective measures, we may not be able to anticipate all cyber-attacks or information or security breaches, nor may we be able to implement effective preventive or defensive measures to address such attacks or breaches.

Cybersecurity risks for financial services organizations have significantly increased in recent years in part because of the proliferation of new and emerging technologies, and the use of the Internet and telecommunications technologies to conduct financial transactions. For example, cybersecurity risks may increase in the future as we continue to increase our mobile-payment and other internet-based product offerings, expand our internal usage of web- or cloud-based products and applications and continue to develop our use of process automation and artificial intelligence. In addition, cybersecurity risks have significantly increased in recent years in part due to the increasingly sophisticated activities of organized crime groups, hackers, terrorist organizations, hostile foreign governments, disgruntled employees or vendors, activists and other external parties, including those involved in corporate espionage. Even the most advanced internal control environment may be vulnerable to compromise. Internal access management failures could result in the compromise or unauthorized exposure of confidential data. Targeted social engineering attacks are becoming more sophisticated and are extremely difficult to prevent. The techniques used by bad actors change frequently and may not be recognized until well after a breach has occurred, at which time the materiality of the breach may be difficult to assess. Additionally, the existence of cyber-attacks or security breaches at third parties with access to our data, such as vendors, may not be disclosed to us in a timely manner.

Although to date we have not experienced any material losses or other material consequences relating to technology failure, cyber-attacks or other information or security breaches, whether directed at us or third parties, there can be no assurance that we will not suffer such material losses or consequences in the future. Our risk and exposure to these matters remain heightened because of, among other things, the evolving nature of these threats, our prominent size and scale, and our role in the financial services industry and the broader economy, our plans to continue to implement our internet banking and mobile banking channel strategies and develop additional remote connectivity solutions to serve our customers when and how they want to be served, our continuous transmission of sensitive information to, and storage of such information by, third parties, including our vendors and regulators, our geographic footprint and international presence, the outsourcing of some of our business operations, threats of cyber terrorism, external extremist parties, including foreign state actors, in some circumstances as a means to promote political ends, and system and customer account updates and conversions. As a result, cybersecurity and the continued development and enhancement of our controls, processes and practices designed to protect our systems, computers, software, data and networks from attack, damage or unauthorized access remain a critical priority.

We also face indirect technology, cybersecurity and operational risks relating to the customers, clients and other third parties with whom we do business or upon whom we rely to facilitate or enable our business activities, including financial counterparties;

financial intermediaries such as clearing agents, exchanges and clearing houses; vendors; regulators; providers of critical infrastructure such as internet access and electrical power; and retailers for whom we process transactions. As a result of increasing consolidation, interdependence and complexity of financial entities and technology systems, a technology failure, cyber-attack or other information or security breach that significantly degrades, deletes or compromises the systems or data of one or more financial entities or third-party or downstream service providers could have a material impact on counterparties or other market participants, including us. This consolidation, interconnectivity and complexity increases the risk of operational failure, on both individual and industry-wide bases, as disparate systems need to be integrated, often on an accelerated basis. Any technology failure, cyber-attack or other information or security breach, termination or constraint of any third party, including downstream service providers, could, among other things, adversely affect our ability to conduct day-to-day business activities, effect transactions, service our clients, manage our exposure to risk, expand our businesses or result in the misappropriation or destruction of the personal, proprietary or confidential information of our employees, customers, suppliers, counterparties and other third parties.

Cyber-attacks or other information or security breaches, whether directed at us or third parties, may result in significant lost revenue, give rise to losses or have other negative consequences. Furthermore, the public perception that a cyber-attack on our systems has been successful, whether or not this perception is correct, may damage our reputation with customers and third parties with whom we do business. Although we maintain cyber insurance, there can be no assurance that liabilities or losses we may incur will be covered under such policies or that the amount of insurance will be adequate. Also, successful penetration or circumvention of system security could result in negative consequences, including loss of customers and business opportunities, the withdrawal of customer deposits, prolonged computer and network outages resulting in disruptions to our critical business operations and customer services, misappropriation or destruction of our confidential information and/or the confidential, proprietary or personal information of certain parties, such as our employees, customers, suppliers, counterparties and other third parties, or damage to their computers or systems. This could result in a violation of applicable privacy and other laws in the U.S. and abroad, litigation exposure, regulatory fines, penalties or intervention, loss of confidence in our security measures, reputational damage, reimbursement or other compensatory costs, additional compliance costs and our internal controls or disclosure controls being rendered ineffective. The occurrence of any of these events could adversely impact our results of operations, liquidity and financial condition.

Our mortgage loan repurchase obligations or claims from third parties could result in additional losses.

We and our legacy companies have sold significant amounts of residential mortgage loans. In connection with these sales, we or certain of our subsidiaries or legacy companies made various representations and warranties, breaches of which may result in a requirement that we repurchase the mortgage loans, or otherwise make whole or provide other remedies to counterparties. At December 31, 2018, we had $14.4 billion of unresolved repurchase claims, net of duplicate claims and excluding claims where the statute of limitations has expired without litigation being commenced.

At December 31, 2018, our liability for obligations under representations and warranties exposures was $2.0 billion. We also have an estimated range of possible loss (RPL) for

representations and warranties exposures that is combined with the litigation RPL, which we disclose in *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements. The recorded liability and estimated RPL are based on currently available information, significant judgment and a number of assumptions that are subject to change. There can be no assurance that the Corporation will reach future settlements or, if it does, that the terms of past settlements can be relied upon to predict the terms of future settlements. Future representations and warranties losses may occur in excess of our recorded liability and estimated RPL, and such losses could have a material adverse effect on our liquidity, financial condition and results of operations.

Additionally, our recorded liability for representations and warranties exposures and the corresponding estimated RPL do not consider certain losses related to servicing, including foreclosure and related costs, fraud, indemnity or claims (including for residential mortgage-backed securities) related to securities law. Losses with respect to one or more of these matters could be material to our results of operations or liquidity.

For more information about our representations and warranties exposure, see Off-Balance Sheet Arrangements and Contractual Obligations – Representations and Warranties in the MD&A on page 40, Complex Accounting Estimates – Representations and Warranties Liability in the MD&A on page 79 and *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements.

Failure to satisfy our obligations as servicer for residential mortgage securitizations, along with other losses we could incur in our capacity as servicer, and foreclosure delays and/or investigations into our residential mortgage foreclosure practices could cause losses.

We and our legacy companies have securitized a significant portion of the residential mortgage loans that we originated or acquired. We service a portion of the loans we have securitized and also service loans on behalf of third-party securitization vehicles and other investors. If we commit a material breach of our obligations as servicer or master servicer, we may be subject to termination if the breach is not cured within a specified period of time following notice, which could cause us to lose servicing income. In addition, for loans principally held in private-label securitization trusts, we may have liability for any failure by us, as a servicer or master servicer, for any act or omission on our part that involves willful misfeasance, bad faith, gross negligence or reckless disregard of our duties. If any such breach was found to have occurred, it may harm our reputation, increase our servicing costs or adversely impact our results of operations. Additionally, with respect to foreclosures, we may incur costs or losses due to irregularities in the underlying documentation, or if the validity of a foreclosure action is challenged by a borrower or overturned by a court because of errors or deficiencies in the foreclosure process. We may also incur costs or losses relating to delays or alleged deficiencies in processing documents necessary to comply with state law governing foreclosure.

Changes in the structure of the GSEs and the relationship among the GSEs, the government and the private markets, or the conversion of the current conservatorship of Fannie Mae or Freddie Mac into receivership, could result in significant changes to our business operations and may adversely impact our business.

During 2018, we sold approximately $3.0 billion of loans to Fannie Mae and Freddie Mac. Each is currently in a conservatorship with its primary regulator, the Federal Housing Finance Agency (FHFA), acting as conservator. We cannot predict whether the conservatorships will end, any associated changes to their business structure that could result or whether the conservatorships will end in receivership, privatization or other change in business structure. There are several proposed approaches to reform that, if enacted, could change the structure and the relationship among the GSEs, the government and the private markets, including the trading markets for agency conforming mortgage loans and markets for mortgage-related securities in which we participate. Although the FHFA has taken steps to unify underwriting parameters and business practices between GSEs, we cannot predict the prospects for the enactment, timing or content of legislative or rulemaking proposals regarding the future status of any GSEs and/or their impact on the guarantees, demand or price of mortgage-related securities. Accordingly, uncertainty regarding their future continues to exist, including whether the GSEs will continue to exist in their current forms or continue to guarantee mortgages and provide funding for mortgage loans.

Any of these developments could adversely affect the value of our securities portfolios, capital levels and liquidity and results of operations.

Our risk management framework may not be effective in mitigating risk and reducing the potential for losses.

Our risk management framework is designed to minimize risk and loss to us. We seek to effectively identify, measure, monitor, report and control the types of risk to which we are subject, including strategic, credit, market, liquidity, compliance, operational and reputational risks. While we employ a broad and diversified set of controls and risk mitigation techniques, including hedging strategies and techniques that seek to balance our ability to profit from trading positions with our exposure to potential losses, our ability to control and mitigate risks that result in losses is inherently limited by our ability to identify all risks, including emerging and unknown risks, anticipate the timing of risks, apply effective hedging strategies, manage and aggregate data correctly and efficiently, and develop risk management models to assess and control risk.

Our ability to manage risk is limited by our ability to develop and maintain a culture of managing risk well throughout the Corporation and manage risks associated with third parties and vendors, to enable effective risk management and ensure that risks are appropriately considered, evaluated and responded to in a timely manner. Uncertain economic conditions, heightened legislative and regulatory scrutiny of the financial services industry and the overall complexity of our operations, among other developments, may result in a heightened level of risk for us. Accordingly, we could suffer losses as a result of our failure to properly anticipate, manage, control or mitigate risks.

For more information about our risk management policies and procedures, see Managing Risk in the MD&A on page 40.

We may not be successful in reorganizing the current business of Merrill Lynch, Pierce, Fenner & Smith Incorporated (MLPF&S) into two affiliated broker-dealers.

As a result of resolution planning, the current business of MLPF&S is expected to be reorganized, subject to regulatory approval, into two affiliated broker-dealers during 2019, MLPF&S and BofA Securities, Inc. In the event that the broker-dealer reorganization is not fully realized or takes longer to realize than expected, we could experience unexpected expenses, reputational damage, compliance and regulatory issues, and lost revenue. For more information about the broker-dealer reorganization, see Capital Management – Broker-dealer Regulatory Capital and Securities Regulation in the MD&A on page 47.

Regulatory, Compliance and Legal

We are subject to comprehensive government legislation and regulations, both domestically and internationally, which impact our operating costs, and could require us to make changes to our operations and result in an adverse impact on our results of operations. Additionally, these regulations and uncertainty surrounding the scope and requirements of the final rules implementing recently enacted and proposed legislation, as well as certain settlements and consent orders we have entered into, have increased and could continue to increase our compliance and operational risks and costs.

We are subject to comprehensive regulation under federal and state laws in the U.S. and the laws of the various jurisdictions in which we operate. These laws and regulations significantly affect and have the potential to restrict the scope of our existing businesses, limit our ability to pursue certain business opportunities, including the products and services we offer, reduce certain fees and rates or make our products and services more expensive for clients and customers.

In response to the financial crisis as well as other factors such as technological and market changes, the U.S. adopted the Financial Reform Act, which has resulted in significant rulemaking and proposed rulemaking by the U.S. Department of the Treasury, Federal Reserve, OCC, CFPB, Financial Stability Oversight Council, FDIC, Department of Labor, SEC and CFTC. For example, under the provisions of the Financial Reform Act known as the "Volcker Rule," we are prohibited from proprietary trading and limited in our sponsorship of, and investment in, hedge funds, private equity funds and certain other covered private funds. Non-U.S. regulators, such as the U.K. financial regulators and the European Parliament and Commission, have adopted or proposed laws and regulations regarding financial institutions located in their jurisdictions, which have required and could require us to make significant modifications to our non-U.S. businesses, operations and legal entity structure in order to comply with these requirements.

We continue to make adjustments to our business and operations, legal entity structure and capital and liquidity management policies, procedures and controls to comply with these laws and regulations, as well as final rulemaking, guidance and interpretation by regulatory authorities. Further, we could become subject to future regulatory requirements beyond those currently proposed, adopted or contemplated. The cumulative effect of all of the legislation and regulations on our business, operations and profitability remains uncertain. This uncertainty necessitates that in our business planning we make certain assumptions with respect to the scope and requirements of the proposed rules. If these assumptions prove incorrect, we could be subject to increased regulatory and compliance risks and costs as well as potential reputational harm. In addition, U.S. and international regulatory initiatives may overlap, and non-U.S. regulations and initiatives may be inconsistent or may conflict with current or proposed U.S. regulations, which could lead to compliance risks and increased costs.

Our regulators' prudential and supervisory authority gives them broad power and discretion to direct our actions, and they have assumed an active oversight, inspection and investigatory role across the financial services industry. However, regulatory focus is not limited to laws and regulations applicable to the financial services industry specifically, but also extends to other significant laws and regulations that apply across industries and jurisdictions, including related to anti-money laundering, anti-corruption and economic sanctions. Additionally, we are subject to laws in the U.S. and abroad, including GDPR, regarding personal and confidential information of certain parties, such as our employees, customers, suppliers, counterparties and other third parties.

As part of their enforcement authority, our regulators have the authority to, among other things, assess significant civil or criminal monetary penalties, fines or restitution, issue cease and desist or removal orders and initiate injunctive actions. The amounts paid by us and other financial institutions to settle proceedings or investigations have been substantial and may increase. In some cases, governmental authorities have required criminal pleas or other extraordinary terms as part of such settlements, which could have significant consequences for a financial institution, including reputational harm, loss of customers, restrictions on the ability to access capital markets, and the inability to operate certain businesses or offer certain products for a period of time.

The Corporation and its employees and representatives are subject to regulatory scrutiny across jurisdictions. Additionally, the complexity of the federal and state regulatory and enforcement regimes in the U.S., coupled with the global scope of our operations and the aggressiveness of the regulatory environment worldwide also means that a single event or practice or a series of related events or practices may give rise to a large number of overlapping investigations and regulatory proceedings, either by multiple federal and state agencies in the U.S. or by multiple regulators and other governmental entities in different jurisdictions. Responding to inquiries, investigations, lawsuits and proceedings, regardless of the ultimate outcome of the matter, is time-consuming and expensive and can divert the attention of our senior management from our business. The outcome of such proceedings may be difficult to predict or estimate until late in the proceedings, which may last a number of years.

We are currently subject to the terms of settlements and consent orders that we have entered into with government agencies and regulatory authorities and may become subject to additional settlements or orders in the future. Such settlements and consent orders impose significant operational and compliance costs on us as they typically require us to enhance our procedures and controls, expand our risk and control functions within our lines of business, invest in technology and hire significant numbers of additional risk, control and compliance personnel. Moreover, if we fail to meet the requirements of the regulatory settlements and orders to which we are subject, or more generally, to maintain risk and control procedures and processes that meet the heightened standards established by our regulators and other government agencies, we could be required to enter into further settlements and orders, pay additional fines, penalties or judgments, or accept material regulatory restrictions on our businesses.

While we believe that we have adopted appropriate risk management and compliance programs to identify, assess, monitor and report on applicable laws, policies and procedures, compliance risks will continue to exist, particularly as we adapt to new rules and regulations. Additionally, there is no guarantee that our risk management and compliance programs will be consistently executed to successfully manage compliance risk. We also rely upon third parties who may expose us to compliance and legal risk. Future legislative or regulatory actions, and any required changes to our business or operations, or those of third parties upon whom we rely, resulting from such developments and actions, could result in a significant loss of revenue, impose additional compliance and other costs or otherwise reduce our profitability, limit the products and services that we offer or our ability to pursue certain business opportunities, require us to dispose of or curtail certain businesses, affect the value of assets that we hold, require us to increase our prices and therefore reduce demand for our products, or otherwise adversely affect our businesses. In addition, legal and regulatory proceedings and other contingencies will arise from time to time that may result in fines, regulatory sanctions, penalties, equitable relief and changes to our business practices. As a result, we are and will continue to be subject to heightened compliance and operating costs that could adversely affect our results of operations.

We are subject to significant financial and reputational risks from potential liability arising from lawsuits and regulatory and government action.

We face significant legal risks in our business, and the volume of claims and amount of damages, penalties and fines claimed in litigation and other disputes, and regulatory and government proceedings against us and other financial institutions continue to be high. Greater than expected litigation and investigation costs, substantial legal liability or significant regulatory or government action against us could have adverse effects on our financial condition, including liquidity, and results of operations or cause significant reputational harm to us. We continue to experience a significant volume of litigation and other disputes, including claims for contractual indemnification with counterparties regarding relative rights and responsibilities. Consumers, clients and other counterparties continue to be litigious. Among other things, financial institutions, including us, continue to be the subject of claims alleging anti-competitive conduct with respect to various products and markets, including U.S. antitrust class actions claiming joint and several liability for treble damages. In addition, regulatory authorities have had a supervisory focus on enforcement, including in connection with alleged violations of law and customer harm. For example, U.S. regulators and government agencies have pursued claims against financial institutions under the Financial Institutions Reform, Recovery, and Enforcement Act, False Claims Act and antitrust laws. Such claims may carry significant and, in certain cases, treble damages. The ongoing environment of extensive regulation, regulatory compliance burdens, litigation and regulatory and government enforcement, combined with uncertainty related to the continually evolving regulatory environment, may affect operational and compliance costs and risks, which may limit our ability to continue providing certain products and services.

Additionally, misconduct by employees, including improper or illegal conduct, can cause significant reputational harm as well as litigation and regulatory action.

For more information on litigation risks, see *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements.

U.S. federal banking agencies may require us to increase our regulatory capital, TLAC, long-term debt or liquidity requirements, which could result in the need to issue additional qualifying securities or to take other actions, such as to sell company assets.

We are subject to U.S. regulatory capital and liquidity rules. These rules, among other things, establish minimum requirements to qualify as a “well-capitalized” institution. If any of our subsidiary insured depository institutions fails to maintain its status as “well capitalized” under the applicable regulatory capital rules, the Federal Reserve will require us to agree to bring the insured depository institution back to “well-capitalized” status. For the duration of such an agreement, the Federal Reserve may impose restrictions on our activities. If we were to fail to enter into or comply with such an agreement, or fail to comply with the terms of such agreement, the Federal Reserve may impose more severe restrictions on our activities, including requiring us to cease and desist activities permitted under the Bank Holding Company Act of 1956.

In the current regulatory environment, capital and liquidity requirements are frequently introduced and amended. It is possible that regulators may increase regulatory capital requirements including TLAC and long-term debt requirements, change how regulatory capital is calculated or increase liquidity requirements. Our risk-based capital surcharge (G-SIB surcharge) may increase from current estimates, and we are also subject to a countercyclical capital buffer which, while currently set at zero, may be increased by regulators. In 2018, the Federal Reserve issued a proposal to implement a stress capital buffer into its capital requirements, which may increase our regulatory capital requirements, if adopted. A significant component of regulatory capital ratios is calculating our risk-weighted assets and our leverage exposure which may increase. The Basel Committee on Banking Supervision has also revised several key methodologies for measuring risk-weighted assets, including a standardized approach for credit risk, standardized approach for operational risk and constraints on the use of internal models, as well as a capital floor based on the revised standardized approaches. U.S. banking regulators may update the U.S. Basel 3 rules to incorporate the Basel Committee revisions. In 2018, U.S. banking regulators published a proposal outlining a standardized approach for counterparty credit risk, which updates the calculation of the exposure amount for derivative contracts under the regulatory capital rule. Additionally, Net Stable Funding Ratio requirements have been proposed, which would apply to us and our subsidiary depository institutions, and target longer term liquidity risk. While the impact of these proposals remains uncertain, they could have a negative impact on our capital and liquidity positions.

As part of its annual CCAR review, the Federal Reserve conducts stress testing on parts of our business using hypothetical economic scenarios prepared by the Federal Reserve. Those scenarios may affect our CCAR stress test results, which may have an effect on our projected regulatory capital amounts in the annual CCAR submission, including the CCAR capital plan affecting our dividends and stock repurchases.

Changes to and compliance with the regulatory capital and liquidity requirements may impact our operations by requiring us to liquidate assets, increase borrowings, issue additional equity or other securities, cease or alter certain operations, sell company assets, or hold highly liquid assets, which may adversely affect our results of operations. We may be prohibited from taking capital actions such as paying or increasing dividends, or repurchasing securities if the Federal Reserve objects to our CCAR capital plan.

For more information, see Capital Management – Regulatory Capital in the MD&A on page 44 and *Note 16 – Regulatory Requirements and Restrictions* to the Consolidated Financial Statements.

Changes in accounting standards or assumptions in applying accounting policies could adversely affect us.

Our accounting policies and methods are fundamental to how we record and report our financial condition and results of operations. Some of these policies require use of estimates and assumptions that may affect the reported value of our assets or liabilities and results of operations and are critical because they require management to make difficult, subjective and complex judgments about matters that are inherently uncertain. If those assumptions, estimates or judgments were incorrectly made, we could be required to correct and restate prior-period financial statements. Accounting standard-setters and those who interpret the accounting standards, the SEC, banking regulators and our independent registered public accounting firm may also amend or even reverse their previous interpretations or positions on how various standards should be applied. These changes may be difficult to predict and could impact how we prepare and report our financial statements. In some cases, we could be required to apply a new or revised standard retrospectively, resulting in us revising prior-period financial statements.

In June 2016, the Financial Accounting Standards Board issued a new accounting standard with respect to accounting for credit losses that will become effective for the Corporation on January 1, 2020. The standard replaces the existing measurement of the allowance for credit losses, which is based on management's best estimate of probable credit losses inherent in the Corporation's lending activities, with management's best estimate of lifetime expected credit losses inherent in the Corporation's financial assets that are recognized at amortized cost. The standard will also expand credit quality disclosures. The impact of this new accounting standard may be an increase in the Corporation's allowance for credit losses at the date of adoption which would result in a negative adjustment to retained earnings. The ultimate impact will depend on the characteristics of the Corporation's portfolio at adoption date as well as the macroeconomic conditions and forecasts as of that date. For more information on some of our critical accounting policies and recent accounting changes, see Complex Accounting Estimates in the MD&A on page 77 and *Note 1 – Summary of Significant Accounting Principles* to the Consolidated Financial Statements.

We may be adversely affected by changes in U.S. and non-U.S. tax laws and regulations.

On December 22, 2017, the President signed into law the Tax Cuts and Jobs Act (the Tax Act) which made significant changes to federal income tax law including, among other things, reducing the statutory corporate income tax rate to 21 percent from 35 percent and changing the taxation of our non-U.S. business activities.

In addition, we have U.K. net deferred tax assets which consist primarily of net operating losses that are expected to be realized by certain subsidiaries over an extended number of years. Adverse developments with respect to tax laws or to other material factors, such as prolonged worsening of Europe's capital markets or changes in the ability of our U.K. subsidiaries to conduct business in the EU, could lead our management to reassess and/or change its current conclusion that no valuation allowance is necessary with respect to our U.K. net deferred tax assets.

It is possible that governmental authorities in the U.S. and/or other countries could further amend tax laws that would adversely affect us, including the possibility that certain favorable aspects of the Tax Act could be amended in the future.

Reputation

Damage to our reputation could harm our businesses, including our competitive position and business prospects.

Our ability to attract and retain customers, clients, investors and employees is impacted by our reputation. Harm to our reputation can arise from various sources, including officer, director or employee misconduct, security breaches, unethical behavior, litigation or regulatory outcomes, compensation practices, the suitability or reasonableness of recommending particular trading or investment strategies, including the reliability of our research and models, prohibiting clients from engaging in certain transactions and sales practices. Additionally, our reputation may be harmed by failing to deliver products, subpar standards of service and quality expected by our customers, clients and the community, compliance failures, inadequacy of responsiveness to internal controls, unintended disclosure of personal, proprietary or confidential information, perception of our environmental, social and governance practices and disclosures, and the activities of our clients, customers and counterparties, including vendors. Actions by the financial services industry generally or by certain members or individuals in the industry also can adversely affect our reputation. In addition, adverse publicity or negative information posted on social media, whether or not factually correct, may adversely impact our business prospects or financial results.

We are subject to complex and evolving laws and regulations regarding privacy, know-your-customer requirements, data protection, including the GDPR, cross-border data movement and other matters. Principles concerning the appropriate scope of consumer and commercial privacy vary considerably in different jurisdictions, and regulatory and public expectations regarding the definition and scope of consumer and commercial privacy may remain fluid. It is possible that these laws may be interpreted and applied by various jurisdictions in a manner inconsistent with our current or future practices, or that is inconsistent with one another. If personal, confidential or proprietary information of customers or clients in our possession is mishandled or misused, or if we do not timely or adequately address mishandled or misused information, we may face regulatory, reputational and operational risks which could have an adverse effect on our financial condition and results of operations.

We could suffer reputational harm if we fail to properly identify and manage potential conflicts of interest. Management of potential conflicts of interests has become increasingly complex as we expand our business activities through more numerous transactions, obligations and interests with and among our clients.

The failure to adequately address, or the perceived failure to adequately address, conflicts of interest could affect the willingness of clients to use our products and services, or give rise to litigation or enforcement actions, which could adversely affect our businesses.

Our actual or perceived failure to address these and other issues, such as operational risks, gives rise to reputational risk that could harm us and our business prospects. Failure to appropriately address any of these issues could also give rise to additional regulatory restrictions, legal risks and reputational harm, which could, among other consequences, increase the size and number of litigation claims and damages asserted or subject us to enforcement actions, fines and penalties and cause us to incur related costs and expenses. For more information on reputational risk, see Reputational Risk Management in the MD&A on page 77.

Other

We face significant and increasing competition in the financial services industry.

We operate in a highly competitive environment and will continue to experience intense competition from local and global financial institutions as well as new entrants, in both domestic and foreign markets, in which we compete on the basis of a number of factors, including customer service, quality and range of products and services offered, technology, price, reputation, interest rates on loans and deposits, lending limits and customer convenience. Additionally, the changing regulatory environment may create competitive disadvantages for us given geography-driven capital and liquidity requirements. For example, U.S. regulators have in certain instances adopted stricter capital and liquidity requirements than those applicable to non-U.S. institutions. To the extent we expand into new business areas and new geographic regions, we may face competitors with more experience and more established relationships with clients, regulators and industry participants in the relevant market, which could adversely affect our ability to compete. In addition, technological advances and the growth of e-commerce have lowered geographic barriers of other financial institutions, made

it easier for non-depository institutions to offer products and services that traditionally were banking products and allowed non-traditional financial service providers to compete with traditional financial service companies in providing electronic and internet-based financial solutions including electronic securities trading, marketplace lending and payment processing. Further, clients may choose to conduct business with other market participants who engage in business or offer products in areas we deem speculative or risky, such as cryptocurrencies. Increased competition may negatively affect our earnings by creating pressure to lower prices or credit standards on our products and services requiring additional investment to improve the quality and delivery of our technology and/or reducing our market share, or affecting the willingness of our clients to do business with us.

Our inability to adapt our products and services to evolving industry standards and consumer preferences could harm our business.

Our business model is based on a diversified mix of businesses that provide a broad range of financial products and services, delivered through multiple distribution channels. Our success depends on our ability to adapt and develop our products, services and technology to evolving industry standards and consumer preferences. There is increasing pressure by competitors to provide products and services on more attractive terms, including higher interest rates on deposits, which may impact our ability to grow revenue and/or effectively compete. Additionally legislative and regulatory developments may affect the competitive landscape. Further, the competitive landscape may be impacted by the growth of non-depository institutions that offer traditional banking products at higher rates or with no fees, or otherwise offer alternative products. This can reduce our net interest margin and revenues from our fee-based products and services. In addition, the widespread adoption of new technologies, including internet services, cryptocurrencies and payment systems, could require substantial expenditures to modify or adapt our existing products and services as we grow and develop our online and mobile banking channel strategies in addition to remote connectivity solutions. We may not be as timely or successful in developing or introducing new products and services, integrating new products or services into our existing offerings, responding or adapting to changes in consumer behavior, preferences, spending, investing and/or saving habits, achieving market acceptance of our products and services, reducing costs in response to pressures to deliver products and services at lower prices or sufficiently developing and maintaining loyal customers. The inability to adapt our products and services to evolving industry standards and consumer preferences could harm our business and adversely affect our results of operations and reputation.

Our ability to attract and retain qualified employees is critical to the success of our business and failure to do so could hurt our business prospects and competitive position.

Our performance is heavily dependent on the talents and efforts of highly skilled individuals. Competition for qualified personnel within the financial services industry and from businesses outside the financial services industry is intense. Our competitors include non-U.S. based institutions and institutions subject to different compensation and hiring regulations than those imposed on U.S. institutions and financial institutions.

In order to attract and retain qualified personnel, we must provide market-level compensation. As a large financial and banking institution, we may be subject to limitations on compensation practices (which may or may not affect our competitors) by the Federal Reserve, the OCC, the FDIC and other regulators around the world. EU and U.K. rules limit and subject to clawback certain forms of variable compensation for senior employees. Current and potential future limitations on executive compensation imposed by legislation or regulation could adversely affect our ability to attract and maintain qualified employees. Furthermore, a substantial portion of our annual incentive compensation paid to our senior employees has in recent years taken the form of long-term equity-based awards. Therefore, the ultimate value of this compensation depends on the price of our common stock when the awards vest. If we are unable to continue to attract and retain qualified individuals, our business prospects and competitive position could be adversely affected.

We could suffer losses if our models and strategies fail to properly anticipate and manage risk.

We use proprietary models and strategies extensively to measure and assess capital requirements for credit, country, market, operational and strategic risks and to assess and control our operations and financial condition. These models require oversight and periodic re-validation and are subject to inherent limitations due to the use of historical trends and simplifying assumptions, and uncertainty regarding economic and financial outcomes. Our models may not be sufficiently predictive of future results due to limited historical patterns, extreme or unanticipated market movements or customer behavior and illiquidity, especially during severe market downturns or stress events, and may not be effective if we fail to detect flaws in our models during our review process, our models contain erroneous data, valuations, formulas or algorithms or our applications running the models do not perform as expected. The models that we use to assess and control our market risk exposures also reflect assumptions about the degree of correlation among prices of various asset classes or other market indicators. Market conditions in recent years have involved unprecedented dislocations and highlight the limitations inherent in using historical data to manage risk. We could suffer losses if models and strategies fail to properly anticipate and manage risks.

Failure to properly manage and aggregate data may result in our inability to manage risk and business needs and inaccurate financial, regulatory and operational reporting.

We rely on our ability to manage, aggregate, interpret and use data in an accurate, timely and complete manner for effective risk reporting and management. Our policies, programs, processes and practices govern how data is managed, aggregated, interpreted and used. While we continuously update our policies, programs, processes and practices, and implement emerging technologies, such as artificial intelligence, our data management and aggregation processes are subject to failure, including human error or system failure. Failure to manage data effectively and to aggregate data in an accurate, timely and complete manner may limit our ability to manage current and emerging risk, to produce accurate financial, regulatory and operational reporting as well as to manage changing business needs.

Reforms to and uncertainty regarding the London InterBank Offered Rate (LIBOR) and certain other indices may adversely affect our business, financial condition and results of operations.

The U.K. FCA announced in July 2017, that it will no longer persuade or require banks to submit rates for LIBOR after 2021. This announcement, in conjunction with financial benchmark reforms more generally and changes in the interbank lending markets, have resulted in uncertainty about the future of LIBOR and certain other rates or indices which are used as interest rate “benchmarks” in many of our products and contracts, including floating-rate notes and other adjustable-rate products. These actions and uncertainties may have the effect of triggering future changes in the rules or methodologies used to calculate benchmarks or lead to the discontinuation or unavailability of benchmarks. ICE Benchmark Administration is the administrator of LIBOR and maintains a reference panel of contributor banks, which includes BANA London branch for certain LIBOR rates. Uncertainty as to the nature and effect of such reforms and actions, and the potential or actual discontinuation of benchmark quotes, may adversely affect the value of, return on and trading market for our financial assets and liabilities that are based on or are linked to benchmarks, including any LIBOR-based securities, loans and derivatives, or our financial condition or results of operations. Additionally, there can be no assurance that we and other market participants will be adequately prepared for an actual discontinuation of benchmarks, including LIBOR, that existing assets and liabilities based on or linked to benchmarks will transition successfully to alternative reference rates or benchmarks or of the timing of adoption and degree of integration of such alternative reference rates or benchmarks in the markets. The discontinuation of benchmarks, including LIBOR, may have an unpredictable impact on the contractual mechanics of outstanding securities, loans, derivatives or other products (including, but not limited to, interest rates to be paid to or by us), require renegotiation of outstanding financial assets and liabilities, adversely affect the return on such outstanding products, cause significant disruption to financial markets that are relevant to our business segments, particularly *Global Banking* and *Global Markets*, increase the risk of litigation and/or increase expenses related to the transition to alternative reference rates or benchmarks, among other adverse consequences. Additionally, any transition from current benchmarks may alter the Corporation’s risk profiles and models, valuation tools, product design and effectiveness of hedging strategies, as well as increase the costs and risks related to potential regulatory requirements. Reforms to and uncertainty regarding transitions from current benchmarks may adversely affect our business, financial condition or results of operations.

Item 1B. Unresolved Staff Comments

None

Item 2. Properties

As of December 31, 2018, our principal offices and other materially important properties consisted of the following:

Facility Name	Location	General Character of the Physical Property	Primary Business Segment	Property Status	Property Square Feet [1]
Bank of America Corporate Center	Charlotte, NC	60 Story Building	Principal Executive Offices	Owned	1,212,177
Bank of America Tower at One Bryant Park	New York, NY	55 Story Building	*GWIM, Global Banking* and *Global Markets*	Leased [2]	1,836,575
Bank of America Merrill Lynch Financial Centre	London, UK	4 Building Campus	*Global Banking* and *Global Markets*	Leased	562,595
Cheung Kong Center	Hong Kong	62 Story Building	*Global Banking* and *Global Markets*	Leased	149,790

(1) For leased properties, property square feet represents the square footage occupied by the Corporation.
(2) The Corporation has a 49.9 percent joint venture interest in this property.

We own or lease approximately 77.3 million square feet in over 20,000 facility and ATM locations globally, including approximately 72.2 million square feet in the U.S. (all 50 states and the District of Columbia, the U.S. Virgin Islands, Puerto Rico and Guam) and approximately 5.1 million square feet in more than 35 countries.
We believe our owned and leased properties are adequate for our business needs and are well maintained. We continue to evaluate our owned and leased real estate and may determine from time to time that certain of our premises and facilities, or ownership structures, are no longer necessary for our operations. In connection therewith, we are evaluating the sale or sale/

leaseback of certain properties and we may incur costs in connection with any such transactions.

Item 3. Legal Proceedings

See Litigation and Regulatory Matters in *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements, which is incorporated herein by reference.

Item 4. Mine Safety Disclosures

None

Part II

Bank of America Corporation and Subsidiaries

Item 5. Market for Registrant’s Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

The principal market on which our common stock is traded is the New York Stock Exchange under the symbol “BAC.”
As of February 25, 2019, there were 170,394 registered shareholders of common stock.
The table below presents share repurchase activity for the three months ended December 31, 2018. The primary source of funds for cash distributions by the Corporation to its shareholders is

dividends received from its bank subsidiaries. Each of the bank subsidiaries is subject to various regulatory policies and requirements relating to the payment of dividends, including requirements to maintain capital above regulatory minimums. All of the Corporation’s preferred stock outstanding has preference over the Corporation’s common stock with respect to payment of dividends.

(Dollars in millions, except per share information; shares in thousands)	Total Common Shares Purchased (1)	Weighted-Average Per Share Price	Total Shares Purchased as Part of Publicly Announced Programs	Remaining Buyback Authority Amounts (2)
October 1 - 31, 2018	54,357	$ 27.78	54,353	$ 14,050
November 1 - 30, 2018	68,630	27.77	68,612	12,145
December 1 - 31, 2018	71,404	25.44	71,401	10,328
Three months ended December 31, 2018	**194,391**	**26.92**	**194,366**	

(1) Includes shares of the Corporation’s common stock acquired by the Corporation in connection with satisfaction of tax withholding obligations on vested restricted stock or restricted stock units and certain forfeitures and terminations of employment-related awards and for potential re-issuance to certain employees under equity incentive plans.

(2) On June 28, 2018, following the Federal Reserve’s non-objection to our 2018 CCAR capital plan, the Board authorized the repurchase of approximately $20.6 billion in common stock from July 1, 2018 through June 30, 2019, including approximately $600 million to offset the effect of equity-based compensation issuances during the same period. During the three months ended December 31, 2018, pursuant to the Board’s authorizations, the Corporation repurchased $5.2 billion of common stock, which included common stock repurchases to offset equity-based compensation awards. On February 7, 2019, the Corporation announced that the Board authorized the repurchase of an additional $2.5 billion of common stock during the first and second quarters of 2019. Amounts shown do not include this additional repurchase authority. For more information, see Capital Management -- CCAR and Capital Planning on page 43 and *Note 13 – Shareholders’ Equity* to the Consolidated Financial Statements.

The Corporation did not have any unregistered sales of equity securities during the three months ended December 31, 2018.

Item 6. Selected Financial Data

See Tables 8 and 9 in the MD&A beginning on page 26, which are incorporated herein by reference.

Item 7. Bank of America Corporation and Subsidiaries Management's Discussion and Analysis of Financial Condition and Results of Operations

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Management's Discussion and Analysis of Financial Condition and Results of Operations

Bank of America Corporation (the "Corporation") and its management may make certain statements that constitute "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. These statements can be identified by the fact that they do not relate strictly to historical or current facts. Forward-looking statements often use words such as "anticipates," "targets," "expects," "hopes," "estimates," "intends," "plans," "goals," "believes," "continue" and other similar expressions or future or conditional verbs such as "will," "may," "might," "should," "would" and "could." Forward-looking statements represent the Corporation's current expectations, plans or forecasts of its future results, revenues, expenses, efficiency ratio, capital measures, strategy and future business and economic conditions more generally, and other future matters. These statements are not guarantees of future results or performance and involve certain known and unknown risks, uncertainties and assumptions that are difficult to predict and are often beyond the Corporation's control. Actual outcomes and results may differ materially from those expressed in, or implied by, any of these forward-looking statements.

You should not place undue reliance on any forward-looking statement and should consider the following uncertainties and risks, as well as the risks and uncertainties more fully discussed under Item 1A. Risk Factors of this Annual Report on Form 10-K: the Corporation's potential claims, damages, penalties, fines and reputational damage resulting from pending or future litigation, regulatory proceedings and enforcement actions and the possibility that amounts may be in excess of the Corporation's recorded liability and estimated range of possible loss for litigation and regulatory exposures; the possibility that the Corporation could face increased servicing, securities, fraud, indemnity, contribution or other claims from one or more counterparties, including trustees, purchasers of loans, underwriters, issuers, other parties involved in securitizations, monolines or private-label and other investors; the possibility that future representations and warranties losses may occur in excess of the Corporation's recorded liability and estimated range of possible loss for its representations and warranties exposures; the Corporation's ability to resolve representations and warranties repurchase and related claims, including claims brought by investors or trustees seeking to avoid the statute of limitations for repurchase claims; the risks related to the discontinuation of the London InterBank Offered Rate and other reference rates, including increased expenses and litigation and the effectiveness of hedging strategies; uncertainties about the financial stability and growth rates of non-U.S. jurisdictions, the risk that those jurisdictions may face difficulties servicing their sovereign debt, and related stresses on financial markets, currencies and trade, and the Corporation's exposures to such risks, including direct, indirect and operational; the impact of U.S. and global interest rates, inflation, currency exchange rates, economic conditions, trade policies, including tariffs, and potential geopolitical instability; the impact on the Corporation's business, financial condition and results of operations of a potential higher interest rate environment; the possibility that future credit losses may be higher than currently expected due to changes in economic assumptions, customer behavior, adverse developments with respect to U.S. or global economic conditions and other uncertainties; the Corporation's ability to achieve its expense targets and expectations regarding net interest income, net charge-offs, loan growth or other projections; adverse changes to the Corporation's credit ratings from the major credit rating agencies; an inability to access capital markets or maintain deposits; estimates of the fair value and other accounting values, subject to impairment assessments, of certain of the Corporation's assets and liabilities; uncertainty regarding the content, timing and impact of regulatory capital and liquidity requirements; the impact of adverse changes to total loss-absorbing capacity requirements and/or global systemically important bank surcharges; the success of our reorganization of Merrill Lynch, Pierce, Fenner & Smith Incorporated*; the potential impact of actions of the* Board of Governors of the Federal Reserve System *on the Corporation's capital plans; the effect of regulations, other guidance or additional information on the impact from the Tax Cuts and Jobs Act; the impact of implementation and compliance with U.S. and international laws, regulations and regulatory interpretations, including, but not limited to, recovery and resolution planning requirements, Federal Deposit Insurance Corporation assessments, the Volcker Rule, fiduciary standards and derivatives regulations; a failure in or breach of the Corporation's operational or security systems or infrastructure, or those of third parties, including as a result of cyber-attacks; the impact on the Corporation's business, financial condition and results of operations from the planned exit of the United Kingdom from the European Union; the impact of a prolonged federal government shutdown and uncertainty regarding the federal government's debt limit; and other similar matters.*

Forward-looking statements speak only as of the date they are made, and the Corporation undertakes no obligation to update any forward-looking statement to reflect the impact of circumstances or events that arise after the date the forward-looking statement was made.

Notes to the Consolidated Financial Statements referred to in the Management's Discussion and Analysis of Financial Condition and Results of Operations (MD&A) are incorporated by reference into the MD&A. Certain prior-year amounts have been reclassified to conform to current-year presentation. Throughout the MD&A, the Corporation uses certain acronyms and abbreviations which are defined in the Glossary.

Executive Summary

Business Overview

The Corporation is a Delaware corporation, a bank holding company (BHC) and a financial holding company. When used in this report, "the Corporation" may refer to Bank of America Corporation individually, Bank of America Corporation and its subsidiaries, or certain of Bank of America Corporation's subsidiaries or affiliates. Our principal executive offices are located in Charlotte, North Carolina. Through our banking and various nonbank subsidiaries throughout the U.S. and in international markets, we provide a diversified range of banking and nonbank financial services and products through four business segments: *Consumer Banking*, *Global Wealth & Investment Management (GWIM)*, *Global Banking* and *Global Markets*, with the remaining operations recorded in *All Other*. We operate our banking activities primarily under the Bank of America, National Association (Bank of America, N.A. or BANA) charter. At December 31, 2018, the Corporation had approximately $2.4 trillion in assets and a headcount of approximately 204,000 employees.

As of December 31, 2018, we served clients through operations across the U.S., its territories and more than 35 countries. Our retail banking footprint covers approximately 85 percent of the U.S. population, and we serve approximately 66 million consumer and small business clients with approximately 4,300 retail financial centers, approximately 16,300 ATMs, and leading digital banking platforms (www.bankofamerica.com) with more than 36 million active users, including over 26 million active mobile users. We offer industry-leading support to approximately three million small business owners. Our wealth management businesses, with client balances of approximately $2.6 trillion, provide tailored solutions to meet client needs through a full set of investment management, brokerage, banking, trust and retirement products. We are a global leader in corporate and investment banking and trading across a broad range of asset classes serving corporations, governments, institutions and individuals around the world.

Recent Developments

Capital Management

During 2018, we repurchased $20.1 billion of common stock pursuant to the Board of Directors' (the Board) repurchase authorizations under our 2018 and 2017 Comprehensive Capital Analysis and Review (CCAR) plans, including repurchases to offset equity-based compensation awards. Also, in addition to the previously announced repurchases associated with the 2018 CCAR capital plan, on February 7, 2019, we announced a plan to repurchase an additional $2.5 billion of common stock through June 30, 2019, which was approved by the Board of Governors of the Federal Reserve System (Federal Reserve). For additional information, see Capital Management on page 43.

U.K. Exit from the EU

We conduct business in Europe, the Middle East and Africa primarily through our subsidiaries in the U.K. and Ireland. A referendum held in the U.K. in 2016 resulted in a majority vote in favor of exiting the European Union (EU). In March 2017, the U.K. notified the EU of its intent to withdraw from the EU, which is scheduled to occur on March 29, 2019. Negotiations between the U.K. and the EU regarding the terms, conditions and timing of the withdrawal are ongoing and the outcome remains uncertain. In preparation for the withdrawal, we have implemented changes to our operating model in the region, including establishing our principal EU banking and broker-dealer operations outside the U.K. The changes are expected to enable us to continue to service our clients with minimal disruption, retain operational flexibility, minimize transition risks and maximize legal entity efficiencies, independent of the outcome and timing of the withdrawal.

LIBOR and Other Benchmark Rates

The U.K. Financial Conduct Authority (FCA), which regulates the London InterBank Offered Rate (LIBOR), announced in July 2017 that it will no longer persuade or require banks to submit rates for LIBOR after 2021. This announcement along with financial benchmark reforms more generally and changes in the interbank lending markets have resulted in uncertainty about the future of LIBOR and certain other rates or indices used as interest rate "benchmarks." These actions and uncertainties may trigger future changes in the rules or methodologies used to calculate benchmarks or lead to the discontinuation or unavailability of benchmarks.

The Corporation has established an enterprise-wide initiative to identify, assess and monitor risks associated with the potential discontinuation or unavailability of benchmarks, including LIBOR, and the transition to alternative reference rates. As part of this initiative, the Corporation is actively engaged with global regulators, industry working groups and trade associations to develop strategies for transitions from current benchmarks to alternative reference rates. We are updating our operational processes and models to support new alternative reference rate activity. In addition, we continue to analyze and evaluate legacy contracts across all products to determine the impact of a discontinuation of LIBOR or other benchmarks and to address consequential changes to those legacy contracts. Certain actions required to mitigate risks associated with the unavailability of benchmarks and implementation of new methodologies and contractual mechanics are dependent on a consensus being reached by the industry or the markets in various jurisdictions around the world. As a result, there is uncertainty as to the solutions that will be developed to address the unavailability of LIBOR or other benchmarks, as well as the overall impact to our businesses, operations and results. Additionally, any transition from current benchmarks may alter the Corporation's risk profiles and models, valuation tools, product design and effectiveness of hedging strategies, as well as increase the costs and risks related to potential regulatory requirements.

Financial Highlights

Table 1 Summary Income Statement and Selected Financial Data

(Dollars in millions, except per share information)	2018	2017

Income statement		
Net interest income	**$ 47,432**	**$ 44,667**
Noninterest income	**43,815**	**42,685**
Total revenue, net of interest expense	**91,247**	**87,352**
Provision for credit losses	**3,282**	**3,396**
Noninterest expense	**53,381**	**54,743**
Income before income taxes	**34,584**	**29,213**
Income tax expense	**6,437**	**10,981**
Net income	**28,147**	**18,232**
Preferred stock dividends	**1,451**	**1,614**
Net income applicable to common shareholders	**$ 26,696**	**$ 16,618**
Per common share information		
Earnings	**$ 2.64**	**$ 1.63**
Diluted earnings	**2.61**	**1.56**
Dividends paid	**0.54**	**0.39**
Performance ratios		
Return on average assets	**1.21 %**	**0.80 %**
Return on average common shareholders' equity	**11.04**	**6.72**
Return on average tangible common shareholders' equity [(1)]	**15.55**	**9.41**
Efficiency ratio	**58.50**	**62.67**
Balance sheet at year end		
Total loans and leases	**$ 946,895**	**$ 936,749**
Total assets	**2,354,507**	**2,281,234**
Total deposits	**1,381,476**	**1,309,545**
Total common shareholders' equity	**242,999**	**244,823**

Total shareholders equity	**265,325**	**267,146**

(1) Return on average tangible common shareholders’ equity is a non-GAAP financial measure. For more information and a corresponding reconciliation to accounting principles generally accepted in the United States of America (GAAP) financial measures, see on page 25.

Net income was $28.1 billion, or $2.61 per diluted share in 2018 compared to $18.2 billion, or $1.56 per diluted share in 2017. The improvement in net income was driven by a decrease in income tax expense due to the impacts of the Tax Cuts and Jobs Act (the Tax Act), an increase in net interest income, higher noninterest income, lower provision for credit losses and a decline in noninterest expense. Impacts from the Tax Act include a reduction in the federal corporate income tax rate to 21 percent from 35 percent. In addition, results for 2017 included a reduction in net income of $2.9 billion due to the Tax Act, driven largely by a lower valuation of certain U.S. deferred tax assets and liabilities.

Net Interest Income

Net interest income increased $2.8 billion to $47.4 billion in 2018 compared to 2017. Net interest yield on a fully taxable-equivalent (FTE) basis increased five basis points (bps) to 2.42 percent for 2018. These increases were primarily driven by higher interest rates as well as loan and deposit growth, partially offset by tightening spreads, higher *Global Markets* funding costs and the impact of the sale of the non-U.S. consumer credit card business in 2017. For more information on net interest yield and the FTE basis, see Supplemental Financial Data on page 24, and for more information on interest rate risk management, see Interest Rate Risk Management for the Banking Book on page 74.

Noninterest Income

Table 2 Noninterest Income

(Dollars in millions)	**2018**	**2017**
Card income	**$ 6,051**	$ 5,902
Service charges	**7,767**	7,818
Investment and brokerage services	**14,160**	13,836
Investment banking income	**5,327**	6,011
Trading account profits	**8,540**	7,277
Other income	**1,970**	1,841
Total noninterest income	**$ 43,815**	$ 42,685

Noninterest income increased $1.1 billion to $43.8 billion in 2018 compared to 2017. The following highlights the significant changes.

- Card income increased $149 million primarily driven by an increase in credit and debit card spending, as well as increased late fees and annual fees, partially offset by higher rewards costs, lower cash advance fees, and the impact of the sale of the non-U.S. consumer credit card business in 2017.
- Investment and brokerage services income increased $324 million primarily due to assets under management (AUM) flows and higher market valuations, partially offset by the impact of changing market dynamics on transactional revenue and AUM pricing.
- Investment banking income decreased $684 million .
- Trading account profits increased $1.3 billion primarily due to increased client activity in equity financing and derivatives, higher market interest rates and strong trading performance in equity derivatives, partially offset by weakness in credit products.
- Other income increased $129 million primarily due to gains on sales of consumer real estate loans, primarily non-core, of $731 million, offset by a $729 million charge related to the redemption of certain trust preferred securities in 2018. Other income for 2017 included a downward valuation adjustment of $946 million on tax-advantaged energy investments in connection with the Tax Act and a $793 million pretax gain recognized in connection with the sale of the non-U.S. consumer credit card business.

Provision for Credit Losses

The provision for credit losses decreased $114 million to $3.3 billion in 2018 compared to 2017, primarily reflecting a 2017 single-name non-U.S. commercial charge-off and improvement in the commercial portfolio. In the consumer portfolio, the impact of the sale of the non-U.S. consumer credit card business in 2017 was more than offset by a slower pace of improvement in the consumer real estate portfolio, and portfolio seasoning and loan growth in the U.S. credit card portfolio. For more information on the provision for credit losses, see Provision for Credit Losses on page 67.

Noninterest Expense

Table 3 Noninterest Expense

(Dollars in millions)	**2018**	2017
Personnel	**$ 31,880**	$ 31,931

Occupancy	**4,066**	4,009
Equipment	**1,705**	1,692
Marketing	**1,674**	1,746
Professional fees	**1,699**	1,888
Data processing	**3,222**	3,139
Telecommunications	**699**	699
Other general operating	**8,436**	9,639
Total noninterest expense	**$53,381**	$54,743

Noninterest expense decreased $1.4 billion to $53.4 billion in 2018 compared to 2017. The decrease was primarily due to lower other general operating expense, primarily driven by a decline in litigation and Federal Deposit Insurance Corporation (FDIC) expense as well as a $316 million impairment charge in 2017 related to certain data centers.

Income Tax Expense

Table 4 Income Tax Expense

(Dollars in millions)	**2018**	2017
Income before income taxes	**$34,584**	$29,213
Income tax expense	**6,437**	10,981
Effective tax rate	**18.6 %**	37.6 %

Tax expense for 2018 reflected the new 21 percent federal income tax rate and the other provisions of the Tax Act, as well as our recurring tax preference benefits.

Tax expense for 2017 included a charge of $1.9 billion reflecting the initial impact of the Tax Act, including a tax charge of $2.3 billion related primarily to a lower valuation of certain deferred tax assets and liabilities and a $347 million tax benefit on the pretax loss from the lower valuation of our tax-advantaged energy investments. Other than the impact of the Tax Act, the effective tax rate for 2017 was driven by our recurring tax preference benefits as well as an expense from the sale of the non-U.S. consumer credit card business, largely offset by benefits related to stock-based compensation and the restructuring of certain subsidiaries.

We expect the effective tax rate for 2019 to be approximately 19 percent, absent unusual items.

Balance Sheet Overview

Table 5 Selected Balance Sheet Data

	December 31		
(Dollars in millions)	**2018**	2017	% Change
Assets			
Cash and cash equivalents	**$ 177,404**	$ 157,434	13 %
Federal funds sold and securities borrowed or purchased under agreements to resell	**261,131**	212,747	23
Trading account assets	**214,348**	209,358	2
Debt securities	**441,753**	440,130	—
Loans and leases	**946,895**	936,749	1
Allowance for loan and lease losses	**(9,601)**	(10,393)	(8)
All other assets	**322,577**	335,209	(4)
Total assets	**$ 2,354,507**	$ 2,281,234	3
Liabilities			
Deposits	**$ 1,381,476**	$ 1,309,545	5
Federal funds purchased and securities loaned or sold under agreements to repurchase	**186,988**	176,865	6
Trading account liabilities	**68,220**	81,187	(16)
Short-term borrowings	**20,189**	32,666	(38)
Long-term debt	**229,340**	227,402	1
All other liabilities	**202,969**	186,423	9
Total liabilities	**2,089,182**	2,014,088	4
Shareholders' equity	**265,325**	267,146	(1)
Total liabilities and shareholders' equity	**$ 2,354,507**	$ 2,281,234	3

Assets

At December 31, 2018, total assets were approximately $2.4 trillion, up $73.3 billion from December 31, 2017. The increase in assets was primarily due to higher securities borrowed or purchased under agreements to resell due to investment of excess cash levels in higher yielding assets and increased client activity, and higher cash and cash equivalents driven by deposit growth.

Cash and Cash Equivalents

Cash and cash equivalents increased $20.0 billion primarily driven by deposit growth, partially offset by investment of short-term excess cash into securities purchased under agreements to resell, and loan growth.

Federal Funds Sold and Securities Borrowed or Purchased Under Agreements to Resell

Federal funds transactions involve lending reserve balances on a short-term basis. Securities borrowed or purchased under agreements to resell are collateralized lending transactions utilized to accommodate customer transactions, earn interest rate spreads, and obtain securities for settlement and for collateral. Federal funds sold and securities borrowed or purchased under agreements to resell increased $48.4 billion due to investment of excess cash levels in higher yielding assets and a higher level of customer financing activity.

Trading Account Assets

Trading account assets consist primarily of long positions in equity and fixed-income securities including U.S. government and agency securities, corporate securities and non-U.S. sovereign debt. Trading account assets increased $5.0 billion primarily driven by additional inventory in fixed-income, currencies and commodities (FICC) to meet expected client demand.

Debt Securities

Debt securities primarily include U.S. Treasury and agency securities, mortgage-backed securities (MBS), principally agency MBS, non-U.S. bonds, corporate bonds and municipal debt. We use the debt securities portfolio primarily to manage interest rate and liquidity risk and to take advantage of market conditions that create economically attractive returns on these investments. Debt securities increased $1.6 billion primarily driven by the deployment of deposit inflows. In 2018, the Corporation transferred available-for-sale (AFS) debt securities with an amortized cost of $64.5 billion to held to maturity. For more information on debt securities, see *Note 4 – Securities* to the Consolidated Financial Statements.

Loans and Leases

Loans and leases increased $10.1 billion primarily due to net loan growth driven by client demand for commercial loans and increases in residential mortgage. For more information on the loan portfolio, see Credit Risk Management on page 51.

Allowance for Loan and Lease Losses

The allowance for loan and lease losses decreased $792 million primarily due to the impact of improvements in credit quality from a stronger economy and continued runoff and sales in the non-core consumer real estate portfolio. For additional information, see Allowance for Credit Losses on page 67.

Liabilities

At December 31, 2018, total liabilities were approximately $2.1 trillion, up $75.1 billion from December 31, 2017, primarily due to deposit growth.

Deposits

Deposits increased $71.9 billion primarily due to an increase in retail deposits.

Federal Funds Purchased and Securities Loaned or Sold Under Agreements to Repurchase

Federal funds transactions involve borrowing reserve balances on a short-term basis. Securities loaned or sold under agreements to repurchase are collateralized borrowing transactions utilized to accommodate customer transactions, earn interest rate spreads and finance assets on the balance sheet. Federal funds purchased and securities loaned or sold under agreements to repurchase increased $10.1 billion primarily due to an increase in matched book funding within *Global Markets*.

Trading Account Liabilities

Trading account liabilities consist primarily of short positions in equity and fixed-income securities including U.S. Treasury and agency securities, corporate securities and non-U.S. sovereign debt. Trading account liabilities decreased $13.0 billion primarily due to lower levels of short positions in government and corporate bonds driven by expected client demand within *Global Markets*.

Short-term Borrowings

Short-term borrowings provide an additional funding source and primarily consist of Federal Home Loan Bank (FHLB) short-term borrowings, notes payable and various other borrowings that generally have maturities of one year or less. Short-term borrowings decreased $12.5 billion primarily due to a decrease in short-term FHLB advances. For more information on short-term borrowings, see *Note 10 – Federal Funds Sold or Purchased, Securities Financing Agreements, Short-term Borrowings and Restricted Cash* to the Consolidated Financial Statements.

Long-term Debt

Long-term debt increased $1.9 billion primarily driven by issuances outpacing maturities and redemptions. For more information on long-term debt, see *Note 11 – Long-term Debt* to the Consolidated Financial Statements.

Shareholders’ Equity

Shareholders’ equitydecreased $1.8 billion driven by returns of capital to shareholders of $27.0 billion through common and preferred stock dividends and share repurchases and a $4.0 billion after-tax decrease in the fair value of AFS debt securities recorded in accumulated other comprehensive income (OCI), largely offset by earnings.

Cash Flows Overview

The Corporation’s operating assets and liabilities support our global markets and lending activities. We believe that cash flows from operations, available cash balances and our ability to generate cash through short- and long-term debt are sufficient to fund our operating liquidity needs. Our investing activities primarily include the debt securities portfolio and loans and leases. Our financing activities reflect cash flows primarily related to customer deposits, securities financing agreements and long-term debt. For more information on liquidity, see Liquidity Risk on page 47.

Supplemental Financial Data

In this Form 10-K, we present certain non-GAAP financial measures. Non-GAAP financial measures exclude certain items or otherwise include components that differ from the most directly comparable measures calculated in accordance with GAAP. Non-GAAP financial measures are provided as additional useful information to assess our financial condition, results of operations (including period-to-period operating performance) or compliance with prospective regulatory requirements. These non-GAAP financial measures are not intended as a substitute for GAAP financial measures and may not be defined or calculated the same way as non-GAAP financial measures used by other companies.

We view net interest income and related ratios and analyses on an FTE basis, which when presented on a consolidated basis, are non-GAAP financial measures. To derive the FTE basis, net interest income is adjusted to reflect tax-exempt income on an equivalent before-tax basis with a corresponding increase in income tax expense. For purposes of this calculation, we used the federal statutory tax rate of 21 percent for 2018 (35 percent for all prior periods) and a representative state tax rate. Net interest yield, which measures the basis points we earn over the cost of funds, utilizes net interest income (and thus total revenue) on an FTE basis. We believe that presentation of these items on an FTE basis allows for comparison of amounts from both taxable and tax-exempt sources and is consistent with industry practices.

We may present certain key performance indicators and ratios excluding certain items (e.g., debit valuation adjustment (DVA) gains (losses)) which result in non-GAAP financial measures. We believe that the presentation of measures that exclude these items is useful because such measures provide additional information to assess the underlying operational performance and trends of our businesses and to allow better comparison of period-to-period operating performance.

We also evaluate our business based on certain ratios that utilize tangible equity, a non-GAAP financial measure. Tangible equity represents an adjusted shareholders’ equity or common shareholders’ equity amount which has been reduced by goodwill and certain acquired intangible assets (excluding mortgage servicing rights (MSRs)), net of related deferred tax liabilities. These measures are used to evaluate our use of equity. In addition, profitability, relationship and investment models use both return on average tangible common shareholders’ equity and return on average tangible shareholders’ equity as key measures to support our overall growth goals. These ratios are as follows:

- Return on average tangible common shareholders’ equity measures our earnings contribution as a percentage of adjusted common shareholders’ equity. The tangible common equity ratio represents adjusted ending common shareholders’ equity divided by total assets less goodwill and certain acquired intangible assets (excluding MSRs), net of related deferred tax liabilities.
- Return on average tangible shareholders’ equity measures our earnings contribution as a percentage of adjusted average total shareholders’ equity. The tangible equity ratio represents adjusted ending shareholders’ equity divided by total assets less goodwill and certain acquired intangible assets (excluding MSRs), net of related deferred tax liabilities.
- Tangible book value per common share represents adjusted ending common shareholders’ equity divided by ending common shares outstanding.

We believe that the use of ratios that utilize tangible equity provides additional useful information because they present measures of those assets that can generate income. Tangible book value per share provides additional useful information about the level of tangible assets in relation to outstanding shares of common stock.

The aforementioned supplemental data and performance measures are presented in Tables 8 and 9.

Non-GAAP Reconciliations

Tables 6 and 7 provide reconciliations of certain non-GAAP financial measures to GAAP financial measures.

Table 6 Five-year Reconciliations to GAAP Financial Measures [1]

(Dollars in millions, shares in thousands)	**2018**	2017	2016	2015	2014
Reconciliation of average shareholders' equity to average tangible shareholders' equity and average tangible common shareholders' equity					
Shareholders' equity	**$ 264,748**	$ 271,289	$ 265,843	$ 251,384	$ 238,317
Goodwill	**(68,951)**	(69,286)	(69,750)	(69,772)	(69,809)
Intangible assets (excluding MSRs)	**(2,058)**	(2,652)	(3,382)	(4,201)	(5,109)
Related deferred tax liabilities	**906**	1,463	1,644	1,852	2,090
Tangible shareholders' equity	**$ 194,645**	$ 200,814	$ 194,355	$ 179,263	$ 165,489
Preferred stock	**(22,949)**	(24,188)	(24,656)	(21,808)	(15,410)
Tangible common shareholders' equity	**$ 171,696**	$ 176,626	$ 169,699	$ 157,455	$ 150,079
Reconciliation of year-end shareholders' equity to year-end tangible shareholders' equity and year-end tangible common shareholders' equity					
Shareholders' equity	**$ 265,325**	$ 267,146	$ 266,195	$ 255,615	$ 243,476
Goodwill	**(68,951)**	(68,951)	(69,744)	(69,761)	(69,777)
Intangible assets (excluding MSRs)	**(1,774)**	(2,312)	(2,989)	(3,768)	(4,612)
Related deferred tax liabilities	**858**	943	1,545	1,716	1,960
	$ 195,458	$ 196,826	$ 195,007	$ 183,802	$ 171,047

Tangible shareholders' equity					
Preferred stock	**(22,326)**	(22,323)	(25,220)	(22,272)	(19,309)
Tangible common shareholders' equity	**$173,132**	$174,503	$169,787	$161,530	$151,738
Reconciliation of year-end assets to year-end tangible assets					
Assets	**$2,354,507**	$2,281,234	$2,188,067	$2,144,606	$2,104,539
Goodwill	**(68,951)**	(68,951)	(69,744)	(69,761)	(69,777)
Intangible assets (excluding MSRs)	**(1,774)**	(2,312)	(2,989)	(3,768)	(4,612)
Related deferred tax liabilities	**858**	943	1,545	1,716	1,960
Tangible assets	$2,284,640	$2,210,914	$2,116,879	$2,072,793	$2,032,110

(1) Presents reconciliations of non-GAAP financial measures to GAAP financial measures. For more information on non-GAAP financial measures and ratios we use in assessing the results of the Corporation, see Supplemental Financial Data on page 24.

Table 7 Quarterly Reconciliations to GAAP Financial Measures (1)

	2018 Quarters				2017 Quarters			
(Dollars in millions)	**Fourth**	Third	Second	First	Fourth	Third	Second	First
Reconciliation of average shareholders' equity to average tangible shareholders' equity and average tangible common shareholders' equity								
Shareholders' equity	**$263,698**	$264,653	$265,181	$265,480	$273,162	$273,238	$270,977	$267,700
Goodwill	**(68,951)**	(68,951)	(68,951)	(68,951)	(68,954)	(68,969)	(69,489)	(69,744)
Intangible assets (excluding MSRs)	**(1,857)**	(1,992)	(2,126)	(2,261)	(2,399)	(2,549)	(2,743)	(2,923)
Related deferred tax liabilities	**874**	896	916	939	1,344	1,465	1,506	1,539
Tangible shareholders' equity	**$193,764**	$194,606	$195,020	$195,207	$203,153	$203,185	$200,251	$196,572
Preferred stock	**(22,326)**	**(22,841)**	**(23,868)**	**(22,767)**	(22,324)	(24,024)	(25,221)	(25,220)
Tangible common shareholders' equity	**$171,438**	$171,765	$171,152	$172,440	$180,829	$179,161	$175,030	$171,352
Reconciliation of period-end shareholders' equity to period-end tangible shareholders' equity and period-end tangible common shareholders' equity								

Shareholders' equity	**$ 265,325**	$ 262,158	$ 264,216	$ 266,224	$ 267,146	$ 271,969	$ 270,660	$ 267,990
Goodwill	**(68,951)**	(68,951)	(68,951)	(68,951)	(68,951)	(68,968)	(68,969)	(69,744)
Intangible assets (excluding MSRs)	**(1,774)**	(1,908)	(2,043)	(2,177)	(2,312)	(2,459)	(2,610)	(2,827)
Related deferred tax liabilities	**858**	878	900	920	943	1,435	1,471	1,513
Tangible shareholders' equity	**$ 195,458**	$ 192,177	$ 194,122	$ 196,016	$ 196,826	$ 201,977	$ 200,552	$ 196,932
Preferred stock	**(22,326)**	(22,326)	(23,181)	(24,672)	(22,323)	(22,323)	(25,220)	(25,220)
Tangible common shareholders' equity	**$ 173,132**	$ 169,851	$ 170,941	$ 171,344	$ 174,503	$ 179,654	$ 175,332	$ 171,712
Reconciliation of period-end assets to period-end tangible assets								
Assets	**$ 2,354,507**	$ 2,338,833	$ 2,291,670	$ 2,328,478	$ 2,281,234	$ 2,284,174	$ 2,254,714	$ 2,247,794
Goodwill	**(68,951)**	(68,951)	(68,951)	(68,951)	(68,951)	(68,968)	(68,969)	(69,744)
Intangible assets (excluding MSRs)	**(1,774)**	(1,908)	(2,043)	(2,177)	(2,312)	(2,459)	(2,610)	(2,827)
Related deferred tax liabilities	**858**	878	900	920	943	1,435	1,471	1,513
Tangible assets	$ 2,284,640	$ 2,268,852	$ 2,221,576	$ 2,258,270	$ 2,210,914	$ 2,214,182	$ 2,184,606	$ 2,176,736

(1) Presents reconciliations of non-GAAP financial measures to GAAP financial measures. For more information on non-GAAP financial measures and ratios we use in assessing the results of the Corporation, see Supplemental Financial Data on page 24.

Table 8 Five-year Summary of Selected Financial Data

(In millions, except per share information)	**2018**	2017	2016	2015	2014
Income statement					
Net interest income	**$ 47,432**	$ 44,667	$ 41,096	$ 38,958	$ 40,779
Noninterest income	**43,815**	42,685	42,605	44,007	45,115
Total revenue, net of interest expense	**91,247**	87,352	83,701	82,965	85,894
Provision for credit losses	**3,282**	3,396	3,597	3,161	2,275
Noninterest expense	**53,381**	54,743	55,083	57,617	75,656
Income before income taxes	**34,584**	29,213	25,021	22,187	7,963
Income tax expense	**6,437**	10,981	7,199	6,277	2,443
Net income	**28,147**	18,232	17,822	15,910	5,520
Net income applicable to common shareholders	**26,696**	16,618	16,140	14,427	4,476
Average common shares issued and outstanding	**10,096.5**	10,195.6	10,284.1	10,462.3	10,527.8
Average diluted common shares issued and outstanding	**10,236.9**	10,778.4	11,046.8	11,236.2	10,584.5
Performance ratios					
Return on average assets	**1.21 %**	0.80 %	0.81 %	0.74 %	0.26 %
Return on average common shareholders' equity	**11.04**	6.72	6.69	6.28	2.01
Return on average tangible common shareholders' equity (1)	**15.55**	9.41	9.51	9.16	2.98
Return on average shareholders' equity	**10.63**	6.72	6.70	6.33	2.32
Return on average tangible shareholders' equity (1)	**14.46**	9.08	9.17	8.88	3.34
Total ending equity to total ending assets	**11.27**	11.71	12.17	11.92	11.57
Total average equity to total average assets	**11.39**	11.96	12.14	11.64	11.11
Dividend payout	**20.31**	24.24	15.94	14.49	28.20
Per common share data					
Earnings	**$ 2.64**	$ 1.63	$ 1.57	$ 1.38	$ 0.43
Diluted earnings	**2.61**	1.56	1.49	1.31	0.42
Dividends paid	**0.54**	0.39	0.25	0.20	0.12
Book value	**25.13**	23.80	23.97	22.48	21.32
Tangible book value (1)	**17.91**	16.96	16.89	15.56	14.43
Market capitalization	**$ 238,251**	$ 303,681	$ 222,163	$ 174,700	$ 188,141
Average balance sheet					
Total loans and leases	**$ 933,049**	$ 918,731	$ 900,433	$ 876,787	$ 898,703
Total assets	**2,325,246**	2,268,633	2,190,218	2,160,536	2,145,393
Total deposits	**1,314,941**	1,269,796	1,222,561	1,155,860	1,124,207
Long-term debt	**230,693**	225,133	228,617	240,059	253,607
Common shareholders' equity	**241,799**	247,101	241,187	229,576	222,907
Total shareholders' equity	**264,748**	271,289	265,843	251,384	238,317
Asset quality (2)					
Allowance for credit losses (3)	**$ 10,398**	$ 11,170	$ 11,999	$ 12,880	$ 14,947
Nonperforming loans, leases and foreclosed properties (4)	**5,244**	6,758	8,084	9,836	12,629
Allowance for loan and lease losses as a percentage of total loans and leases outstanding (4)	**1.02 %**	1.12 %	1.26 %	1.37 %	1.66 %
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases (4)	**194**	161	149	130	121
Net charge-offs (5)	**$ 3,763**	$ 3,979	$ 3,821	$ 4,338	$ 4,383
Net charge-offs as a percentage of average loans and leases outstanding (4, 5)	**0.41 %**	0.44 %	0.43 %	0.50 %	0.49 %
Capital ratios at year end (6)					

Common equity tier 1 capital	**11.6** %	11.5 %	10.8 %	9.8 %	9.6 %
Tier 1 capital	**13.2**	13.0	12.4	11.2	11.0
Total capital	**15.1**	14.8	14.2	12.8	12.7
Tier 1 leverage	**8.4**	8.6	8.8	8.4	7.8
Supplementary leverage ratio	**6.8**	n/a	n/a	n/a	n/a
Tangible equity (1)	**8.6**	8.9	9.2	8.9	8.4
Tangible common equity (1)	**7.6**	7.9	8.0	7.8	7.5

(1) Tangible equity ratios and tangible book value per share of common stock are non-GAAP financial measures. For more information on these ratios and corresponding reconciliations to GAAP financial measures, see Supplemental Financial Data on page 24.

(2) Asset quality metrics include $75 million of non-U.S. consumer credit card net charge-offs in 2017 and $243 million of non-U.S. consumer credit card allowance for loan and lease losses, $9.2 billion of non-U.S. consumer credit card loans and $175 million of non-U.S. consumer credit card net charge-offs in 2016. The Corporation sold its non-U.S. consumer credit card business in 2017.

(3) Includes the allowance for loan and leases losses and the reserve for unfunded lending commitments.

(4) Balances and ratios do not include loans accounted for under the fair value option. For additional exclusions from nonperforming loans, leases and foreclosed properties, see Consumer Portfolio Credit Risk Management – Nonperforming Consumer Loans, Leases and Foreclosed Properties Activity on page 58 and corresponding Table 31 and Commercial Portfolio Credit Risk Management – Nonperforming Commercial Loans, Leases and Foreclosed Properties Activity on page 63 and corresponding Table 38.

(5) Net charge-offs exclude $273 million, $207 million, $340 million, $808 million and $810 million of write-offs in the purchased credit-impaired (PCI) loan portfolio for 2018, 2017, 2016, 2015 and 2014, respectively.

(6) Basel 3 transition provisions for regulatory capital adjustments and deductions were fully phased-in as of January 1, 2018. Prior periods are presented on a fully phased-in basis. For additional information, including which approach is used to assess capital adequacy, see Capital Management on page 43.

n/a = not applicable

Table 9 Selected Quarterly Financial Data

(In millions, except per share information)	2018 Quarters Fourth	Third	Second	First	2017 Quarters Fourth	Third	Second	First
Income statement								
Net interest income	**$ 12,304**	$ 11,870	$ 11,650	$ 11,608	$ 11,462	$ 11,161	$ 10,986	$ 11,058
Noninterest income (1)	**10,432**	10,907	10,959	11,517	8,974	10,678	11,843	11,190
Total revenue, net of interest expense	**22,736**	22,777	22,609	23,125	20,436	21,839	22,829	22,248
Provision for credit losses	**905**	716	827	834	1,001	834	726	835
Noninterest expense	**13,133**	13,067	13,284	13,897	13,274	13,394	13,982	14,093
Income before income taxes	**8,698**	8,994	8,498	8,394	6,161	7,611	8,121	7,320
Income tax expense (1)	**1,420**	1,827	1,714	1,476	3,796	2,187	3,015	1,983
Net income (1)	**7,278**	7,167	6,784	6,918	2,365	5,424	5,106	5,337
Net income applicable to common shareholders	**7,039**	6,701	6,466	6,490	2,079	4,959	4,745	4,835
Average common shares issued and outstanding	**9,855.8**	10,031.6	10,181.7	10,322.4	10,470.7	10,197.9	10,013.5	10,099.6
Average diluted common shares issued and outstanding	**9,996.0**	10,170.8	10,309.4	10,472.7	10,621.8	10,746.7	10,834.8	10,919.7
Performance ratios								
Return on average assets	**1.24 %**	1.23 %	1.17 %	1.21 %	0.41 %	0.95 %	0.90 %	0.97 %
Four-quarter trailing return on average assets (2)	**1.21**	1.00	0.93	0.86	0.80	0.91	0.89	0.88
Return on average common shareholders' equity	**11.57**	10.99	10.75	10.85	3.29	7.89	7.75	8.09
Return on average tangible common shareholders' equity (3)	**16.29**	15.48	15.15	15.26	4.56	10.98	10.87	11.44
Return on average shareholders' equity	**10.95**	10.74	10.26	10.57	3.43	7.88	7.56	8.09
Return on average tangible shareholders' equity (3)	**14.90**	14.61	13.95	14.37	4.62	10.59	10.23	11.01
Total ending equity to total ending assets	**11.27**	11.21	11.53	11.43	11.71	11.91	12.00	11.92
Total average equity to total average assets	**11.30**	11.42	11.42	11.41	11.87	12.03	11.94	12.00
Dividend payout	**20.90**	22.35	18.83	19.06	60.35	25.59	15.78	15.64
Per common share data								
Earnings	**$ 0.71**	$ 0.67	$ 0.64	$ 0.63	$ 0.20	$ 0.49	$ 0.47	$ 0.48
Diluted earnings	**0.70**	0.66	0.63	0.62	0.20	0.46	0.44	0.45
Dividends paid	**0.15**	0.15	0.12	0.12	0.12	0.12	0.075	0.075
Book value	**25.13**	24.33	24.07	23.74	23.80	23.87	24.85	24.34

Tangible book value (3)	**17.91**	17.23	17.07	16.84	16.96	17.18	17.75	17.22
Market capitalization	**$ 238,251**	$ 290,424	$ 282,259	$ 305,176	$ 303,681	$ 264,992	$ 239,643	$ 235,291
Average balance sheet								
Total loans and leases	**$ 934,721**	$ 930,736	$ 934,818	$ 931,915	$ 927,790	$ 918,129	$ 914,717	$ 914,144
Total assets	**2,334,586**	2,317,829	2,322,678	2,325,878	2,301,687	2,271,104	2,269,293	2,231,649
Total deposits	**1,344,951**	1,316,345	1,300,659	1,297,268	1,293,572	1,271,711	1,256,838	1,256,632
Long-term debt	**230,616**	233,475	229,037	229,603	227,644	227,309	224,019	221,468
Common shareholders' equity	**241,372**	241,812	241,313	242,713	250,838	249,214	245,756	242,480
Total shareholders' equity	**263,698**	264,653	265,181	265,480	273,162	273,238	270,977	267,700
Asset quality (4)								
Allowance for credit losses (5)	**$ 10,398**	$ 10,526	$ 10,837	$ 11,042	$ 11,170	$ 11,455	$ 11,632	$ 11,869
Nonperforming loans, leases and foreclosed properties (6)	**5,244**	5,449	6,181	6,694	6,758	6,869	7,127	7,637
Allowance for loan and lease losses as a percentage of total loans and leases outstanding (6)	**1.02 %**	1.05 %	1.08 %	1.11 %	1.12 %	1.16 %	1.20 %	1.25 %
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases (6)	**194**	189	170	161	161	163	160	156
Net charge-offs (7)	**$ 924**	$ 932	$ 996	$ 911	$ 1,237	$ 900	$ 908	$ 934
Annualized net charge-offs as a percentage of average loans and leases outstanding (6, 7)	**0.39 %**	0.40 %	0.43 %	0.40 %	0.53 %	0.39 %	0.40 %	0.42 %
Capital ratios at period end (8)								
Common equity tier 1 capital	**11.6 %**	11.4 %	11.4 %	11.3 %	11.5 %	11.9 %	11.5 %	11.0 %
Tier 1 capital	**13.2**	12.9	13.0	13.0	13.0	13.4	13.2	12.6
Total capital	**15.1**	14.7	14.8	14.8	14.8	15.1	15.0	14.3
Tier 1 leverage	**8.4**	8.3	8.4	8.4	8.6	8.9	8.8	8.8
Supplementary leverage ratio	**6.8**	6.7	6.7	6.8	n/a	n/a	n/a	n/a
Tangible equity (3)	**8.6**	8.5	8.7	8.7	8.9	9.1	9.2	9.1
Tangible common equity (3)	**7.6**	7.5	7.7	7.6	7.9	8.1	8.0	7.9

(1) Net income for the fourth quarter of 2017 included a charge of $2.9 billion related to the Tax Act effects which consisted of $946 million in noninterest income and $1.9 billion in income tax expense.

(2) Calculated as total net income for four consecutive quarters divided by annualized average assets for four consecutive quarters.

(3) Tangible equity ratios and tangible book value per share of common stock are non-GAAP financial measures. For more information on these ratios and corresponding reconciliations to GAAP financial measures, see Supplemental Financial Data on page 24.

(4) Asset quality metrics include $31 million of non-U.S. consumer credit card net charge-offs for the second quarter of 2017 and $242 million of non-U.S. consumer credit card allowance for loan and lease losses, $9.5 billion of non-U.S. consumer credit card loans and $44 million of non-U.S. consumer credit card net charge-offs for the first quarter of 2017. The Corporation sold its non-U.S. consumer credit card business in the second quarter of 2017.

(5) Includes the allowance for loan and lease losses and the reserve for unfunded lending commitments.

(6) Balances and ratios do not include loans accounted for under the fair value option. For additional exclusions from nonperforming loans, leases and foreclosed properties, see Consumer Portfolio Credit Risk Management – Nonperforming Consumer Loans, Leases and Foreclosed Properties Activity on page 58 and corresponding Table 31 and Commercial Portfolio Credit Risk Management – Nonperforming Commercial Loans, Leases and Foreclosed Properties Activity on page 63 and corresponding Table 38.

(7) Net charge-offs exclude $107 million, $95 million, $36 million and $35 million of write-offs in the PCI loan portfolio in the fourth, third, second and first quarters of 2018, and $46 million, $73 million, $55 million and $33 million in the fourth, third, second and first quarters of 2017, respectively.

(8) Basel 3 transition provisions for regulatory capital adjustments and deductions were fully phased-in as of January 1, 2018. Prior periods are presented on a fully phased-in basis. For additional information, including which approach is used to assess capital adequacy, see Capital Management on page 43.

n/a = not applicable

Table 10 Average Balances and Interest Rates - FTE Basis

(Dollars in millions)	**Average Balance**	**Interest Income/ Expense**	**Yield/ Rate**	Average Balance	Interest Income/ Expense	Yield/ Rate	Average Balance	Interest Income/ Expense	Yield/ Rate
	2018			2017			2016		
Earning assets									
Interest-bearing deposits with the Federal Reserve, non-U.S. central banks and other banks	**$ 139,848**	**$ 1,926**	**1.38 %**	$ 127,431	$ 1,122	0.88 %	$ 133,374	$ 605	0.45 %
Time deposits placed and other short-term investments	**9,446**	**216**	**2.29**	12,112	241	1.99	9,026	140	1.55
Federal funds sold and securities borrowed or purchased under agreements to resell (1)	**251,328**	**3,176**	**1.26**	222,818	1,806	0.81	216,161	967	0.45
Trading account assets	**132,724**	**4,901**	**3.69**	129,007	4,618	3.58	129,766	4,563	3.52
Debt securities	**437,312**	**11,837**	**2.66**	435,005	10,626	2.44	418,289	9,263	2.23
Loans and leases (2):									
Residential mortgage	**207,523**	**7,294**	**3.51**	197,766	6,831	3.45	188,250	6,488	3.45
Home equity	**53,886**	**2,573**	**4.77**	62,260	2,608	4.19	71,760	2,713	3.78
U.S. credit card	**94,612**	**9,579**	**10.12**	91,068	8,791	9.65	87,905	8,170	9.29
Non-U.S. credit card (3)	**—**	**—**	**—**	3,929	358	9.12	9,527	926	9.72
Direct/Indirect and other consumer (4)	**93,036**	**3,104**	**3.34**	96,002	2,734	2.85	94,148	2,371	2.52
Total consumer	**449,057**	**22,550**	**5.02**	451,025	21,322	4.73	451,590	20,668	4.58
U.S. commercial	**304,387**	**11,937**	**3.92**	292,452	9,765	3.34	276,887	8,101	2.93
Non-U.S. commercial	**97,664**	**3,220**	**3.30**	95,005	2,566	2.70	93,263	2,337	2.51
Commercial real estate (5)	**60,384**	**2,618**	**4.34**	58,502	2,116	3.62	57,547	1,773	3.08
Commercial lease financing	**21,557**	**698**	**3.24**	21,747	706	3.25	21,146	627	2.97
Total commercial	**483,992**	**18,473**	**3.82**	467,706	15,153	3.24	448,843	12,838	2.86
Total loans and leases (3)	**933,049**	**41,023**	**4.40**	918,731	36,475	3.97	900,433	33,506	3.72
Other earning assets (1)	**76,524**	**4,300**	**5.62**	76,957	3,224	4.19	59,775	2,496	4.18
Total earning assets (1,6)	**1,980,231**	**67,379**	**3.40**	1,922,061	58,112	3.02	1,866,824	51,540	2.76
Cash and due from banks	**25,830**			27,995			27,893		
Other assets, less allowance for loan and lease losses	**319,185**			318,577			295,501		
Total assets	**$ 2,325,246**			$ 2,268,633			$ 2,190,218		
Interest-bearing liabilities									
U.S. interest-bearing deposits:									
Savings	**$ 54,226**	**$ 6**	**0.01 %**	$ 53,783	$ 5	0.01 %	$ 49,495	$ 5	0.01 %
NOW and money market deposit accounts	**676,382**	**2,636**	**0.39**	628,647	873	0.14	589,737	294	0.05
Consumer CDs and IRAs	**39,823**	**157**	**0.39**	44,794	121	0.27	48,594	133	0.27
Negotiable CDs, public funds and other deposits	**50,593**	**991**	**1.96**	36,782	354	0.96	32,889	160	0.49
	821,024	**3,790**	**0.46**	764,006	1,353	0.18	720,715	592	0.08

Total U.S. interest-bearing deposits									
Non-U.S. interest-bearing deposits:									
Banks located in non-U.S. countries	**2,312**	**39**	**1.69**	2,442	21	0.85	3,891	32	0.82
Governments and official institutions	**810**	**—**	**0.01**	1,006	10	0.95	1,437	9	0.64
Time, savings and other	**65,097**	**666**	**1.02**	62,386	547	0.88	59,183	382	0.65
Total non-U.S. interest-bearing deposits	**68,219**	**705**	**1.03**	65,834	578	0.88	64,511	423	0.66
Total interest-bearing deposits	**889,243**	**4,495**	**0.51**	829,840	1,931	0.23	785,226	1,015	0.13
Federal funds purchased, securities loaned or sold under agreements to repurchase, short-term borrowings and other interest-bearing liabilities (1)	**269,748**	**5,839**	**2.17**	274,975	3,146	1.14	252,585	1,933	0.77
Trading account liabilities	**50,928**	**1,358**	**2.67**	45,518	1,204	2.64	37,897	1,018	2.69
Long-term debt	**230,693**	**7,645**	**3.31**	225,133	6,239	2.77	228,617	5,578	2.44
Total interest-bearing liabilities (1,6)	**1,440,612**	**19,337**	**1.34**	1,375,466	12,520	0.91	1,304,325	9,544	0.73
Noninterest-bearing sources:									
Noninterest-bearing deposits	**425,698**			439,956			437,335		
Other liabilities (1)	**194,188**			181,922			182,715		
Shareholders' equity	**264,748**			271,289			265,843		
Total liabilities and shareholders' equity	**$ 2,325,246**			$ 2,268,633			$ 2,190,218		
Net interest spread			**2.06 %**			2.11 %			2.03 %
Impact of noninterest-bearing sources			**0.36**			0.26			0.22
Net interest income/yield on earning assets (7)		**$ 48,042**	**2.42 %**		$ 45,592	2.37 %		$ 41,996	2.25 %

(1) Certain prior-period amounts have been reclassified to conform to current period presentation.
(2) Nonperforming loans are included in the respective average loan balances. Income on these nonperforming loans is generally recognized on a cost recovery basis.
(3) Includes assets of the Corporation's non-U.S. consumer credit card business, which was sold during the second quarter of 2017.
(4) Includes non-U.S. consumer loans of $2.8 billion, $2.9 billion and $3.4 billion in 2018, 2017 and 2016, respectively.
(5) Includes U.S. commercial real estate loans of $56.4 billion, $55.0 billion and $54.2 billion, and non-U.S. commercial real estate loans of $4.0 billion, $3.5 billion and $3.4 billion in 2018, 2017 and 2016, respectively.
(6) Interest income includes the impact of interest rate risk management contracts, which decreased interest income on the underlying assets by $171 million, $44 million and $176 million in 2018, 2017 and 2016, respectively. Interest expense includes the impact of interest rate risk management contracts, which decreased interest expense on the underlying liabilities by $130 million, $1.4 billion and $2.1 billion in 2018, 2017 and 2016, respectively. For more information, see Interest Rate Risk Management for the Banking Book on page 74.
(7) Net interest income includes FTE adjustments of $610 million, $925 million and $900 million in 2018, 2017 and 2016, respectively.

Table 11 **Analysis of Changes in Net Interest Income - FTE Basis**

	Due to Change in [1]			Due to Change in [1]		
	Volume	**Rate**	**Net Change**	Volume	Rate	Net Change
(Dollars in millions)	**From 2017 to 2018**			From 2016 to 2017		
Increase (decrease) in interest income						
Interest-bearing deposits with the Federal Reserve, non-U.S. central banks and other banks	**$ 109**	**$ 695**	**$ 804**	$ (32)	$ 549	$ 517
Time deposits placed and other short-term investments	**(53)**	**28**	**(25)**	48	53	101
Federal funds sold and securities borrowed or purchased under agreements to resell	**230**	**1,140**	**1,370**	36	803	839
Trading account assets	**134**	**149**	**283**	(22)	77	55
Debt securities	**44**	**1,167**	**1,211**	438	925	1,363
Loans and leases:						
Residential mortgage	**329**	**134**	**463**	335	8	343
Home equity	**(350)**	**315**	**(35)**	(360)	255	(105)
U.S. credit card	**339**	**449**	**788**	290	331	621
Non-U.S. credit card [2]	**(358)**	**—**	**(358)**	(544)	(24)	(568)
Direct/Indirect and other consumer	**(82)**	**452**	**370**	48	315	363
Total consumer			**1,228**			654
U.S. commercial	**402**	**1,770**	**2,172**	468	1,196	1,664
Non-U.S. commercial	**71**	**583**	**654**	48	181	229
	70	**432**	**502**	29	314	343

Commercial real estate						
Commercial lease financing	**(5)**	**(3)**	**(8)**	19	60	79
Total commercial			**3,320**			2,315
Total loans and leases			**4,548**			2,969
Other earning assets	**(18)**	**1,094**	**1,076**	721	7	728
Total interest income			**$ 9,267**			$ 6,572
Increase (decrease) in interest expense						
U.S. interest-bearing deposits:						
Savings	**$—**	**$ 1**	**$ 1**	$—	$—	$—
NOW and money market deposit accounts	**74**	**1,689**	**1,763**	20	559	579
Consumer CDs and IRAs	**(13)**	**49**	**36**	(12)	—	(12)
Negotiable CDs, public funds and other deposits	**132**	**505**	**637**	20	174	194
Total U.S. interest-bearing deposits			**2,437**			761
Non-U.S. interest-bearing deposits:						
Banks located in non-U.S. countries	**(1)**	**19**	**18**	(12)	1	(11)
Governments and official institutions	**(2)**	**(8)**	**(10)**	(3)	4	1
Time, savings and other	**26**	**93**	**119**	24	141	165
Total non-U.S. interest-bearing deposits			**127**			155
Total interest-bearing deposits			**2,564**			916
Federal funds purchased, securities loaned or sold under agreements to repurchase, short-term borrowings and other interest-bearing liabilities	**(71)**	**2,764**	**2,693**	184	1,029	1,213
Trading account liabilities	**140**	**14**	**154**	206	(20)	186
Long-term debt	**151**	**1,255**	**1,406**	(85)	746	661
			6,817			2,976

Total interest expense		
Net increase in net interest income (3)	**$ 2,450**	$ 3,596

(1) The changes for each category of interest income and expense are divided between the portion of change attributable to the variance in volume and the portion of change attributable to the variance in rate for that category. The unallocated change in rate or volume variance is allocated between the rate and volume variances.
(2) The Corporation sold its non-U.S. credit card business in the second quarter of 2017.
(3) Includes changes in FTE basis adjustments of a $315 million decrease from 2017 to 2018 and a $25 million increase from 2016 to 2017.

Business Segment Operations

Segment Description and Basis of Presentation

We report our results of operations through the following four business segments: *Consumer Banking, GWIM, Global Banking* and *Global Markets*, with the remaining operations recorded in *All Other*. We manage our segments and report their results on an FTE basis. For more information on our presentation of financial information on an FTE basis, see Supplemental Financial Data on page 24. The primary activities, products and businesses of the business segments and *All Other* are shown below.

We periodically review capital allocated to our businesses and allocate capital annually during the strategic and capital planning processes. We utilize a methodology that considers the effect of regulatory capital requirements in addition to internal risk-based capital models. Our internal risk-based capital models use a risk-adjusted methodology incorporating each segment's credit, market, interest rate, business and operational risk components. For more information on the nature of these risks, see Managing Risk on page 40. The capital allocated to the business segments is referred to as allocated capital. Allocated equity in the reporting units is comprised of allocated capital plus capital for the portion of goodwill and intangibles specifically assigned to the reporting unit. For more information, including the definition of reporting unit, see *Note 8 – Goodwill and Intangible Assets* to the Consolidated Financial Statements.

For more information on the basis of presentation for business segments and reconciliations to consolidated total revenue, net income and year-end total assets, see *Note 23 – Business Segment Information* to the Consolidated Financial Statements.

Consumer Banking

	Deposits		Consumer Lending		Total Consumer Banking		
(Dollars in millions)	**2018**	2017	**2018**	2017	**2018**	2017	% Change
Net interest income	**$16,024**	$13,353	**$11,099**	$10,954	**$27,123**	$24,307	12 %
Noninterest income:							
Card income	**8**	8	**5,281**	5,062	**5,289**	5,070	4
Service charges	**4,298**	4,265	**2**	1	**4,300**	4,266	1
All other income	**430**	391	**381**	487	**811**	878	(8)
Total noninterest income	**4,736**	4,664	**5,664**	5,550	**10,400**	10,214	2
Total revenue, net of interest expense	**20,760**	18,017	**16,763**	16,504	**37,523**	34,521	9
Provision for credit losses	**195**	201	**3,469**	3,324	**3,664**	3,525	4
Noninterest expense	**10,522**	10,388	**7,191**	7,407	**17,713**	17,795	—
Income before income taxes	**10,043**	7,428	**6,103**	5,773	**16,146**	13,201	22
Income tax expense	**2,561**	2,813	**1,556**	2,186	**4,117**	4,999	(18)
Net income	**$7,482**	$4,615	**$4,547**	$3,587	**$12,029**	$8,202	47
Effective tax rate (1)					**25.5 %**	37.9 %	
Net interest yield	**2.35 %**	2.05 %	**3.97 %**	4.18 %	**3.78**	3.54	
Return on average allocated capital	**62**	38	**18**	14	**33**	22	
Efficiency ratio	**50.68**	57.66	**42.90**	44.88	**47.20**	51.55	
Balance Sheet							
Average							
Total loans and leases	**$5,233**	$5,084	**$278,574**	$260,974	**$283,807**	$266,058	7 %
Total earning assets (2)	**682,600**	651,963	**279,217**	261,802	**717,197**	686,612	4
Total assets (2)	**710,925**	679,306	**290,068**	273,253	**756,373**	725,406	4
Total deposits	**678,640**	646,930	**5,533**	6,390	**684,173**	653,320	5
Allocated capital	**12,000**	12,000	**25,000**	25,000	**37,000**	37,000	—
Year end							
Total loans and leases	**$5,470**	$5,143	**$288,865**	$275,330	**$294,335**	$280,473	5 %
Total earning assets (2)	**694,676**	675,485	**289,249**	275,742	**728,817**	709,832	3
Total assets (2)	**724,015**	703,330	**299,970**	287,390	**768,877**	749,325	3
Total deposits	**691,666**	670,802	**4,480**	5,728	**696,146**	676,530	3

(1) Estimated at the segment level only.

(2) In segments and businesses where the total of liabilities and equity exceeds assets, we allocate assets from *All Other* to match the segments' and businesses' liabilities and allocated shareholders' equity. As a result, total earning assets and total assets of the businesses may not equal total *Consumer Banking*.

Consumer Banking, which is comprised of Deposits and Consumer Lending, offers a diversified range of credit, banking and investment products and services to consumers and small businesses. Deposits and Consumer Lending include the net impact of migrating customers and their related deposit, brokerage asset and loan balances between Deposits, Consumer Lending and *GWIM*, as well as other client-managed businesses. Our customers and clients have access to a coast to coast network including financial centers in 34 states and the District of Columbia. Our network includes approximately 4,300 financial centers, approximately 16,300 ATMs, nationwide call centers, and leading digital banking platforms with more than 36 million active users, including over 26 million active mobile users.

Consumer Banking Results

Net income for *Consumer Banking* increased $3.8 billion to $12.0 billion in 2018 compared to 2017 primarily driven by higher pretax income and lower income tax expense from the reduction in the federal income tax rate. The increase in pretax income was driven by higher revenue and lower noninterest expense, partially offset by higher provision for credit losses. Net interest income increased $2.8 billion to $27.1 billion primarily due to the beneficial impact of an increase in investable assets as a result of an increase in deposits, as well as higher interest rates, pricing discipline and loan growth. Noninterest income increased $186 million to $10.4 billion driven by higher card income, partially offset by lower mortgage banking income, which is included in all other income.

The provision for credit losses increased $139 million to $3.7 billion driven by portfolio seasoning and loan growth in the U.S. credit card portfolio. Noninterest expense decreased $82 million to $17.7 billion driven by operating efficiencies and lower litigation and FDIC expense. These decreases were partially offset by investments in digital capabilities and business growth, including primary sales professionals, combined with investments in new financial centers and renovations.

The return on average allocated capital was 33 percent, up from 22 percent, driven by higher net income. For more information on capital allocated to the business segments, see Business Segment Operations on page 30.

Deposits

Deposits includes the results of consumer deposit activities which consist of a comprehensive range of products provided to consumers and small businesses. Our deposit products include traditional savings accounts, money market savings accounts, CDs and IRAs, and noninterest- and interest-bearing checking accounts, as well as investment accounts and products. Net interest income is allocated to the deposit products using our funds transfer pricing process that matches assets and liabilities with similar interest rate sensitivity and maturity characteristics. Deposits generates fees such as account service fees, non-sufficient funds fees, overdraft charges and ATM fees, as well as investment and brokerage fees from Merrill Edge accounts. Merrill Edge is an integrated investing and banking service targeted at customers with less than $250,000 in investable assets. Merrill

Edge provides investment advice and guidance, client brokerage asset services, a self-directed online investing platform and key banking capabilities including access to the Corporation's network of financial centers and ATMs.

Net income for Deposits increased $2.9 billion to $7.5 billion in 2018 driven by higher revenue and lower income tax expense, partially offset by higher noninterest expense. Net interest income increased $2.7 billion to $16.0 billion primarily due to the beneficial impact of an increase in investable assets as a result of higher deposits, and pricing discipline. Noninterest income increased $72 million to $4.7 billion primarily driven by higher service charges.

The provision for credit losses decreased $6 million to $195 million in 2018. Noninterest expense increased $134 million to $10.5 billion primarily driven by investments in digital capabilities and business growth, including primary sales professionals, combined with investments in new financial centers and renovations. These increases were partially offset by lower litigation and FDIC expense.

Average deposits increased $31.7 billion to $678.6 billion in 2018 driven by strong organic growth. Growth in checking, money market savings and traditional savings of $36.3 billion was partially offset by a decline in time deposits of $4.6 billion.

Key Statistics – Deposits

	2018	2017
Total deposit spreads (excludes noninterest costs) (1)	**2.14 %**	1.84 %
Year end		
Client brokerage assets (in millions)	**$ 185,881**	$ 177,045
Active digital banking users (units in thousands) (2)	**36,264**	34,855
Active mobile banking users (units in thousands)	**26,433**	24,238
Financial centers	**4,341**	4,477
ATMs	**16,255**	16,039

(1) Includes deposits held in Consumer Lending.
(2) Digital users represents mobile and/or online users across consumer businesses.

Client brokerage assets increased $8.8 billion in 2018 driven by strong client flows, partially offset by market performance. Active mobile banking users increased 2.2 million reflecting continuing changes in our customers' banking preferences. The number of financial centers declined by a net 136 reflecting changes in customer preferences to self-service options as we continue to optimize our consumer banking network and improve our cost to serve.

Consumer Lending

Consumer Lending offers products to consumers and small businesses across the U.S. The products offered include credit and debit cards, residential mortgages and home equity loans, and direct and indirect loans such as automotive, recreational vehicle and consumer personal loans. In addition to earning net interest spread revenue on its lending activities, Consumer Lending generates interchange revenue from credit and debit card transactions, late fees, cash advance fees, annual credit card fees, mortgage banking fee income and other miscellaneous fees. Consumer Lending products are available to our customers through our retail network, direct telephone, and online and mobile channels. Consumer Lending results also include the impact of

servicing residential mortgages and home equity loans in the core portfolio, including loans held on the balance sheet of Consumer Lending and loans serviced for others.

Net income for Consumer Lending increased $960 million to $4.5 billion in 2018 driven by lower income tax expense, higher revenue and lower noninterest expense, partially offset by higher provision for credit losses. Net interest income increased $145 million to $11.1 billion primarily driven by higher interest rates and the impact of an increase in loan balances. Noninterest income increased $114 million to $5.7 billion driven by higher card income, partially offset by lower mortgage banking income.

The provision for credit losses increased $145 million to $3.5 billion driven by portfolio seasoning and loan growth in the U.S. credit card portfolio. Noninterest expense decreased $216 million to $7.2 billion primarily driven by operating efficiencies.

Average loans increased $17.6 billion to $278.6 billion in 2018 driven by increases in residential mortgages and U.S. credit card loans, partially offset by lower home equity balances.

Key Statistics – Consumer Lending

(Dollars in millions)	2018	2017
Total U.S. credit card [1]		
Gross interest yield	**10.12 %**	9.65 %
Risk-adjusted margin	**8.34**	8.67
New accounts (in thousands)	**4,544**	4,939
Purchase volumes	**$ 264,706**	$ 244,753
Debit card purchase volumes	**$ 318,562**	$ 298,641

(1) In addition to the U.S. credit card portfolio in *Consumer Banking*, the remaining U.S. credit card portfolio is in *GWIM*.

During 2018, the total U.S. credit card risk-adjusted margin decreased 33 bps compared to 2017, primarily driven by increased net charge-offs and higher credit card rewards costs. Total U.S. credit card purchase volumes increased $20.0 billion to $264.7 billion, and debit card purchase volumes increased $19.9 billion to $318.6 billion, reflecting higher levels of consumer spending.

Key Statistics – Loan Production [1]

(Dollars in millions)	2018	2017
Total [2]:		
First mortgage	**$ 41,195**	$ 50,581
Home equity	**14,869**	16,924
Consumer Banking:		
First mortgage	**$ 27,280**	$ 34,065
Home equity	**13,251**	15,199

(1) The loan production amounts represent the unpaid principal balance of loans and, in the case of home equity, the principal amount of the total line of credit.

(2) In addition to loan production in *Consumer Banking*, there is also first mortgage and home equity loan production in *GWIM*.

First mortgage loan originations in *Consumer Banking* and for the total Corporation decreased $6.8 billion and $9.4 billion in 2018 primarily driven by a higher interest rate environment driving lower first-lien mortgage refinances. Home equity production in *Consumer Banking* and for the total Corporation decreased $1.9 billion and $2.1 billion in 2018 primarily driven by lower demand.

Global Wealth & Investment Management

(Dollars in millions)	2018	2017	% Change
Net interest income	**$ 6,294**	$ 6,173	2 %
Noninterest income:			
Investment and brokerage services	**11,959**	11,394	5
All other income	**1,085**	1,023	6
Total noninterest income	**13,044**	12,417	5
Total revenue, net of interest expense	**19,338**	18,590	4
Provision for credit losses	**86**	56	54
Noninterest expense	**13,777**	13,556	2
Income before income taxes	**5,475**	4,978	10
Income tax expense	**1,396**	1,885	(26)
Net income	**$ 4,079**	$ 3,093	32
Effective tax rate	**25.5 %**	37.9 %	
Net interest yield	**2.42**	2.32	
Return on average allocated capital	**28**	22	
Efficiency ratio	**71.24**	72.92	
Balance Sheet			
Average			
Total loans and leases	**$ 161,342**	$ 152,682	6 %
Total earning assets	**259,807**	265,670	(2)
Total assets	**277,219**	281,517	(2)
Total deposits	**241,256**	245,559	(2)
Allocated capital	**14,500**	14,000	4
Year end			
Total loans and leases	**$ 164,854**	$ 159,378	3 %
Total earning assets	**287,197**	267,026	8
Total assets	**305,906**	284,321	8
Total deposits	**268,700**	246,994	9

GWIM consists of two primary businesses: Merrill Lynch Global Wealth Management (MLGWM) and U.S. Trust, Bank of America Private Wealth Management (U.S. Trust).

MLGWM’s advisory businessprovides a high-touch client experience through a network of financial advisors focused on clients with over $250,000 in total investable assets. MLGWM provides tailored solutions to meet clients’ needs through a full set of investment management, brokerage, banking and retirement products.

U.S. Trust, together with MLGWM's Private Banking & Investments Group,provides comprehensive wealth management solutions targeted to high net worth and ultra high net worth clients, as well as customized solutions to meet clients' wealth structuring, investment management, trust and banking needs, including specialty asset management services.

Net income for *GWIM* increased $986 million to $4.1 billion in 2018 compared to 2017 due to higher revenue and lower income tax expense from the reduction in the federal income tax rate, partially offset by an increase in noninterest expense and provision for credit losses. The operating margin was 28 percent compared to 27 percent a year ago.

Net interest income increased $121 million to $6.3 billion due to higher deposit spreads and average loan balances, partially offset by lower loan spreads and average deposit balances.

Noninterest income, which primarily includes investment and brokerage services income, increased $627 million to $13.0 billion. The increase was driven by the impact of AUM flows and higher market valuations, partially offset by the impact of changing market dynamics on transactional revenue and AUM pricing.

Noninterest expense increased $221 million to $13.8 billion primarily due to higher revenue-related incentive expense and investments for business growth, partially offset by continued expense discipline.

The return on average allocated capital was 28 percent, up from 22 percent, as higher net income was partially offset by an increased capital allocation. For more information on capital allocated to the business segments, see Business Segment Operations on page 30.

Revenue from MLGWM of $15.9 billion and revenue from U.S. Trust of $3.4 billion both increased four percent due to higher asset management fees driven by higher net flows and market valuations, and an increase in net interest income. The increase in MLGWM revenue was partially offset by lower AUM pricing and transactional revenue.

Key Indicators and Metrics

(Dollars in millions, except as noted)	**2018**	2017
Revenue by Business		
Merrill Lynch Global Wealth Management	**$ 15,895**	$ 15,288
U.S. Trust	**3,432**	3,295
Other	**11**	7
Total revenue, net of interest expense	**$ 19,338**	$ 18,590
Client Balances by Business, at year end		
Merrill Lynch Global Wealth Management	**$ 2,193,562**	$ 2,305,664
U.S. Trust	**427,294**	446,199
Total client balances	**$ 2,620,856**	$ 2,751,863
Client Balances by Type, at year end		
Assets under management	**$ 1,021,221**	$ 1,080,747
Brokerage and other assets	**1,162,997**	1,261,990
Deposits	**268,700**	246,994
Loans and leases (1)	**167,938**	162,132
Total client balances	**$ 2,620,856**	$ 2,751,863
Assets Under Management Rollforward		
Assets under management, beginning of year	**$ 1,080,747**	$ 886,148
Net client flows	**36,406**	95,707
Market valuation/other	**(95,932)**	98,892
Total assets under management, end of year	**$ 1,021,221**	$ 1,080,747
Associates, at year end (2)		
Number of financial advisors	**17,518**	17,355
Total wealth advisors, including financial advisors	**19,459**	19,238
Total primary sales professionals, including financial advisors and wealth advisors	**20,556**	20,318
Merrill Lynch Global Wealth Management Metric		
Financial advisor productivity (3) (in thousands)	**$ 1,034**	$ 1,005
U.S. Trust Metric, at year end		
Primary sales professionals	**1,747**	1,714

(1) Includes margin receivables which are classified in customer and other receivables on the Consolidated Balance Sheet.

(2) Includes financial advisors in the *Consumer Banking* segment of 2,722 and 2,402 at December 31, 2018 and 2017.

(3) Financial advisor productivity is defined as MLGWM total revenue, excluding the allocation of certain asset and liability management (ALM) activities, divided by the total average number of financial advisors (excluding financial advisors in the *Consumer Banking* segment).

Client Balances

Client balances managed under advisory and/or discretion of *GWIM* are AUM and are typically held in diversified portfolios. Fees earned on AUM are calculated as a percentage of clients' AUM balances. The asset management fees charged to clients per year depend on various factors, but are commonly driven by the breadth of the client's relationship. The net client AUM flows represent the net change in clients' AUM balances over a specified period

of time, excluding market appreciation/depreciation and other adjustments.

Client balances decreased $131.0 billion, or five percent, in 2018 to $2.6 trillion, primarily due to lower market valuations on AUM and brokerage balances, as measured at December 31, 2018, partially offset by positive flows.

Global Banking

(Dollars in millions)	**2018**	2017	% Change
Net interest income	**$ 10,881**	$ 10,504	4 %
Noninterest income:			
Service charges	**3,027**	3,125	(3)
Investment banking fees	**2,891**	3,471	(17)
All other income	**2,845**	2,899	(2)
Total noninterest income	**8,763**	9,495	(8)
Total revenue, net of interest expense	**19,644**	19,999	(2)
Provision for credit losses	**8**	212	(96)
Noninterest expense	**8,591**	8,596	—
Income before income taxes	**11,045**	11,191	(1)
Income tax expense	**2,872**	4,238	(32)
Net income	**$ 8,173**	$ 6,953	18
Effective tax rate	**26.0 %**	37.9 %	
Net interest yield	**2.98**	2.93	
Return on average allocated capital	**20**	17	
Efficiency ratio	**43.73**	42.98	
Balance Sheet			
Average			
Total loans and leases	**$ 354,236**	$ 346,089	2 %
Total earning assets	**364,748**	358,302	2
Total assets	**424,353**	416,038	2
Total deposits	**336,337**	312,859	8
Allocated capital	**41,000**	40,000	3
Year end			
Total loans and leases	**$ 365,717**	$ 350,668	4 %
Total earning assets	**377,812**	365,560	3
Total assets	**441,477**	424,533	4
Total deposits	**360,248**	329,273	9

Global Banking, which includes Global Corporate Banking, Global Commercial Banking, Business Banking and Global Investment Banking, provides a wide range of lending-related products and services, integrated working capital management and treasury solutions, and underwriting and advisory services through our network of offices and client relationship teams. Our lending products and services include commercial loans, leases, commitment facilities, trade finance, commercial real estate lending and asset-based lending. Our treasury solutions business includes treasury management, foreign exchange and short-term investing options. We also provide investment banking products to our clients such as debt and equity underwriting and distribution, and merger-related and other advisory services. Underwriting debt and equity issuances, fixed-income and equity research, and certain market-based activities are executed through our global broker-dealer affiliates, which are our primary dealers in several countries. Within *Global Banking,* Global Commercial Banking clients generally include middle-market companies, commercial real estate firms and not-for-profit companies. Global Corporate Banking clients generally include large global corporations, financial institutions and leasing clients. Business Banking clients include mid-sized U.S.-based businesses requiring customized and integrated financial advice and solutions.

Net income for *Global Banking* increased $1.2 billion to $8.2 billion in 2018 compared to 2017 primarily driven by lower income tax expense from the reduction in the federal income tax rate and lower provision for credit losses, partially offset by lower revenue. Noninterest expense was relatively unchanged.

Revenue decreased $355 million to $19.6 billion driven by lower noninterest income, partially offset by higher net interest income. Net interest income increased $377 million to $10.9 billion primarily due to the impact of higher interest rates, as well as loan and deposit growth. Noninterest income decreased $732 million to $8.8 billion primarily due to lower investment banking fees. The provision for credit losses improved $204 million to $8 million primarily driven by *Global Banking's* portion of a 2017 single-name non-U.S. commercial charge-off and continued improvement in the commercial portfolio.

The return on average allocated capital was 20 percent, up from 17 percent, as higher net income was partially offset by an increased capital allocation. For more information on capital allocated to the business segments, see Business Segment Operations on page 30.

Global Corporate, Global Commercial and Business Banking

Global Corporate, Global Commercial and Business Banking each include Business Lending and Global Transaction Services activities. Business Lending includes various lending-related products and services, and related hedging activities, including commercial loans, leases, commitment facilities, trade finance, real estate lending and asset-based lending. Global Transaction Services includes deposits, treasury management, credit card, foreign exchange and short-term investment products.

The table below and following discussion present a summary of the results, which exclude certain investment banking activities in *Global Banking*.

Global Corporate, Global Commercial and Business Banking

	Global Corporate Banking		Global Commercial Banking		Business Banking		Total	
	2018	2017	**2018**	2017	**2018**	2017	**2018**	2017
(Dollars in millions)								
Revenue								
Business Lending	**$4,122**	$4,387	**$4,039**	$4,280	**$393**	$404	**$8,554**	$9,071
Global Transaction Services	**3,656**	3,322	**3,288**	3,017	**973**	849	**7,917**	7,188
Total revenue, net of interest expense	**$7,778**	$7,709	**$7,327**	$7,297	**$1,366**	$1,253	**$16,471**	$16,259
Balance Sheet								
Average								
Total loans and leases	**$163,516**	$158,292	**$174,279**	$170,101	**$16,432**	$17,682	**$354,227**	$346,075
Total deposits	**163,559**	148,704	**135,337**	127,720	**37,462**	36,435	**336,358**	312,859
Year end								
Total loans and leases	**$174,378**	$163,184	**$175,937**	$169,997	**$15,402**	$17,500	**$365,717**	$350,681
Total deposits	**173,183**	155,614	**149,118**	137,538	**37,973**	36,120	**360,274**	329,272

Business Lending revenue decreased $517 million in 2018 compared to 2017. The decrease was primarily driven by the impact of tax reform on certain tax-advantaged investments and lower leasing-related revenues.

Global Transaction Services revenue increased $729 million to $7.9 billion in 2018 compared to 2017 driven by higher short-term rates and increased deposits.

Average loans and leases increased two percent in 2018 compared to 2017 driven by growth in the commercial and industrial, and commercial real estate portfolios. Average deposits increased eight percent due to growth in domestic and international interest-bearing balances.

Global Investment Banking

Client teams and product specialists underwrite and distribute debt, equity and loan products, and provide advisory services and tailored risk management solutions. The economics of certain investment banking and underwriting activities are shared primarily between *Global Banking* originates certain deal-related transactions with our corporate and commercial clients that are executed and distributed by *Global Markets*. To provide a complete discussion of our consolidated investment banking fees, the following table presents total Corporation investment banking *Global Banking* *Global Banking* originates certain deal-related transactions with our corporate and commercial clients that are executed and distributed by *Global Markets*. To provide a complete discussion of our consolidated investment banking fees, the following table presents total Corporation investment banking fees and the portion attributable to *Global Banking.*and *Global Banking* originates certain deal-related transactions with our corporate and commercial clients that are executed and distributed by *Global Markets*. To provide a complete discussion of our consolidated investment banking fees, the following table presents total Corporation investment banking fees and the portion attributable to *Global Banking.Global Markets Global Banking* originates certain deal-related transactions with our corporate and commercial clients that are executed and distributed by *Global Markets*. To provide a complete discussion of our consolidated investment banking fees, the following table presents total Corporation investment banking fees and the portion attributable to *Global Banking.* under an internal revenue-sharing arrangement. *Global Banking* originates certain deal-related transactions with our corporate and commercial clients that are executed and distributed by *Global Markets*. To provide a complete discussion of our consolidated investment banking fees, the following table presents total Corporation investment banking fees and the portion attributable to *Global Banking.*

fees and the portion attributable to *Global Banking.*

Investment Banking Fees

	Global Banking		Total Corporation	
(Dollars in millions)	**2018**	2017	**2018**	2017
Products				
Advisory	**$1,152**	$1,557	**$1,258**	$1,691
Debt issuance	**1,327**	1,506	**3,084**	3,635
Equity issuance	**412**	408	**1,183**	940
Gross investment banking fees	**2,891**	3,471	**5,525**	6,266
Self-led deals	**(68)**	(113)	**(198)**	(255)
Total investment banking fees	**$2,823**	$3,358	**$5,327**	$6,011

Total Corporation investment banking fees, excluding self-led deals, of $5.3 billion, which are primarily included within *Global Banking* and *Global Markets,* decreased 11 percent in 2018 compared to 2017 primarily due to declines in advisory fees and debt underwriting, the latter of which was driven by lower fee pools.

Global Markets

(Dollars in millions)	2018	2017	% Change
Net interest income	**$ 3,171**	$ 3,744	(15)%
Noninterest income:			
Investment and brokerage services	**1,780**	2,049	(13)
Investment banking fees	**2,296**	2,476	(7)
Trading account profits	**7,932**	6,710	18
All other income	**884**	972	(9)
Total noninterest income	**12,892**	12,207	6
Total revenue, net of interest expense	**16,063**	15,951	1
Provision for credit losses	**—**	164	(100)
Noninterest expense	**10,686**	10,731	—
Income before income taxes	**5,377**	5,056	6
Income tax expense	**1,398**	1,763	(21)
Net income	**$ 3,979**	$ 3,293	21
Effective tax rate	**26.0 %**	34.9 %	
Return on average allocated capital	**11**	9	
Efficiency ratio	**66.53**	67.27	
Balance Sheet			
Average			
Trading-related assets:			
Trading account securities	**$ 215,112**	$ 216,996	(1)%
Reverse repurchases	**125,084**	101,795	23
Securities borrowed	**78,889**	82,210	(4)
Derivative assets	**46,047**	40,811	13
Total trading-related assets	**465,132**	441,812	5
Total loans and leases	**72,651**	71,413	2
Total earning assets	**473,383**	449,441	5
Total assets	**666,003**	638,673	4
Total deposits	**31,209**	32,864	(5)
Allocated capital	**35,000**	35,000	—

Year end			
Total trading-related assets	**$447,998**	$419,375	7 %
Total loans and leases	**73,928**	76,778	(4)
Total earning assets	**457,224**	449,314	2
Total assets	**641,922**	629,013	2
Total deposits	**37,841**	34,029	11

Global Markets offers sales and trading services and research services to institutional clients across fixed-income, credit, currency, commodity and equity businesses. *Global Markets Global Markets* provides market-making, financing, securities clearing, settlement and custody services globally to our institutional investor clients in support of their investing and trading activities. We also work with our commercial and corporate clients to provide risk management products using interest rate, equity, credit, currency and commodity derivatives, foreign exchange, fixed-income and mortgage-related products. As a result of our market-making activities in these products, we may be required to manage risk in a broad range of financial products including government securities, equity and equity-linked securities, high-grade and high-yield corporate debt securities, syndicated loans, MBS, commodities and asset-backed securities. The economics of certain investment banking and underwriting activities are shared primarily between *Global Markets* and *Global Banking* under an internal revenue-sharing arrangement. *Global Banking* originates certain deal product coverage includes securities and derivative products in both the primary and secondary markets. *Global Markets* provides market-making, financing, securities clearing, settlement and custody services globally to our institutional investor clients in support of their investing and trading activities. We also work with our commercial and corporate clients to provide risk management products using interest rate, equity, credit, currency and commodity derivatives, foreign exchange, fixed-income and mortgage-related products. As a result of our market-making activities in these products, we may be required to manage risk in a broad range of financial products including government securities, equity and equity-linked securities, high-grade and high-yield corporate debt securities, syndicated loans, MBS, commodities and asset-backed securities. The economics of certain investment banking and underwriting activities are shared primarily between *Global Markets* and *Global Ban*

-related transactions with our corporate and commercial clients that are executed and distributed by *Global Markets*. For information on investment banking fees on a consolidated basis, see page 36.*king* under an internal revenue-sharing arrangement. *Global Banking* originates certain deal-related transactions with our corporate and commercial clients that are executed and distributed by *Global Markets*. For information on investment banking fees on a consolidated basis, see page 36.

Net income for *Global Markets* increased $686 million to $4.0 billion in 2018 compared to 2017. Net DVA losses were $162 million compared to losses of $428 million in 2017. Excluding net DVA, net income increased $544 million to $4.1 billion. These increases were primarily driven by lower income tax expense from the reduction in the federal income tax rate, a decrease in the provision for credit losses and modestly higher revenue.

Sales and trading revenue, excluding net DVA, increased $19 million due to higher Equities revenue, largely offset by lower FICC revenue. The provision for credit losses decreased $164 million driven by *Global Markets'* portion of a single-name non-U.S. commercial charge-off in 2017. Noninterest expense decreased $45 million to $10.7 billion primarily due to lower operating costs.

Average total assets increased $27.3 billion to $666.0 billion in 2018 primarily driven by increased levels of inventory in FICC to facilitate client demand and growth in Equities derivative client financing activities. Total year-end assets increased $12.9 billion to $641.9 billion at December 31, 2018 due to increased levels of inventory in FICC.

The return on average allocated capital was 11 percent, up from 9 percent, reflecting higher net income. For more information on capital allocated to the business segments, see Business Segment Operations on page 30.

Sales and Trading Revenue

Sales and trading revenue includes unrealized and realized gains and losses on trading and other assets, net interest income, and fees primarily from commissions on equity securities. Sales and trading revenue is segregated into fixed-income (government debt obligations, investment and non-investment grade corporate debt obligations, commercial MBS, residential mortgage-backed securities, collateralized loan obligations, interest rate and credit derivative contracts), currencies (interest rate and foreign exchange contracts), commodities (primarily futures, forwards, swaps and options) and equities (equity-linked derivatives and cash equity activity). The following table and related discussion present sales and trading revenue, substantially all of which is in *Global Markets,* with the remainder in *Global Banking*. In addition, the following table and related discussion present sales and trading revenue, excluding net DVA, which is a non-GAAP financial measure. For more information on net DVA, see Supplemental Financial Data on page 24.

Sales and Trading Revenue [1, 2]

(Dollars in millions)	**2018**	2017
Sales and trading revenue		
Fixed-income, currencies and commodities	**$8,186**	$8,657
Equities	**4,876**	4,120
Total sales and trading revenue	**$13,062**	$12,777
Sales and trading revenue, excluding net DVA [3]		
Fixed-income, currencies and commodities	**$8,328**	$9,051
Equities	**4,896**	4,154
Total sales and trading revenue, excluding net DVA	**$13,224**	$13,205

(1) Includes FTE adjustments of $249 million and $236 million for 2018 and 2017. For more information on sales and trading revenue, see *Note 3 – Derivatives* to the Consolidated Financial Statements.

(2) Includes *Global Banking* sales and trading revenue of $430 million and $236 million for 2018 and 2017.

(3) FICC and Equities sales and trading revenue, excluding net DVA, is a non-GAAP financial measure. FICC net DVA losses were $142 million and $394 million for 2018 and 2017. Equities net DVA losses were $20 million and $34 million for 2018 and 2017.

The following explanations for year-over-year changes in sales and trading, FICC and Equities revenue exclude net DVA, but would be the same whether net DVA was included or excluded. FICC revenue decreased $723 million in 2018 primarily due to lower activity and a less favorable market in credit-related products. The decline in FICC revenue was also impacted by higher funding costs, which were driven by increases in market interest rates. Equities revenue increased $742 million in 2018 driven by strength in client financing and derivatives.

All Other

(Dollars in millions)	**2018**	2017	% Change
Net interest income	**$573**	$864	(34)%
Noninterest income (loss)	**(1,284)**	(1,648)	(22)
Total revenue, net of interest expense	**(711)**	(784)	(9)
Provision for credit losses	**(476)**	(561)	(15)

Noninterest expense	**2,614**	4,065	(36)
Loss before income taxes	**(2,849)**	(4,288)	(34)
Income tax benefit	**(2,736)**	(979)	n/m
Net loss	**$ (113)**	$ (3,309)	(97)
Balance Sheet			
Average			
Total loans and leases	**$ 61,013**	$ 82,489	(26)%
Total assets [(1)]	**201,298**	206,999	(3)
Total deposits	**21,966**	25,194	(13)
Year end			
Total loans and leases	**$ 48,061**	$ 69,452	(31)%
Total assets [(1)]	**196,325**	194,042	1
Total deposits	**18,541**	22,719	(18)

(1) In segments where the total of liabilities and equity exceeds assets, which are generally deposit-taking segments, we allocate assets from *All Other* to those segments to match liabilities (i.e., deposits) and allocated shareholders' equity. Average allocated assets were $517.0 billion and $515.6 billion for 2018 and 2017, and year-end allocated assets were $540.8 billion and $520.4 billion at December 31, 2018 and 2017.

n/m = not meaningful

All Other consists of ALM activities, equity investments, non-core mortgage loans and servicing activities, the net impact of periodic revisions to the MSR valuation model for core and non-core MSRs and the related economic hedge results, liquidating businesses and residual expense allocations. ALM activities encompass certain residential mortgages, debt securities, interest rate and foreign currency risk management activities, the impact of certain

allocation methodologies and hedge ineffectiveness. The results of certain ALM activities are allocated to our business segments. For more information on our ALM activities, see *Note 23 – Business Segment Information* to the Consolidated Financial Statements. Equity investments include our merchant services joint venture as well as a portfolio of equity, real estate and other alternative investments. For more information on our merchant services joint venture, see *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements.

The Corporation classifies consumer real estate loans as core or non-core based on loan and customer characteristics. For more information on the core and non-core portfolios, see Consumer Portfolio Credit Risk Management on page 51. Residential mortgage loans that are held for ALM purposes, including interest rate or liquidity risk management, are classified as core and are presented on the balance sheet of *All Other*. During 2018, residential mortgage loans held for ALM activities decreased $3.6 billion to $24.9 billion at December 31, 2018 primarily as a result of payoffs and paydowns. Non-core residential mortgage and home equity loans, which are principally runoff portfolios, are also held in *All Other*. During 2018, total non-core loans decreased $17.8 billion to $23.5 billion at December 31, 2018 due primarily to loan sales of $10.8 billion, as well as payoffs and paydowns.

The net loss for *All Other* improved $3.2 billion to a loss of $113 million, driven by a charge of $2.9 billion in 2017 due to enactment of the Tax Act. The pretax loss for 2018 compared to 2017 decreased $1.4 billion primarily due to lower noninterest expense.

Revenue increased $73 million to a loss of $711 million primarily due to gains of $731 million from the sale of consumer real estate loans, primarily non-core, offset by a $729 million charge related to the redemption of certain trust preferred securities in 2018. Results for 2017 included a downward valuation adjustment of $946 million on tax-advantaged energy investments in connection with the Tax Act and a pretax gain of $793 million recognized in connection with the sale of the non-U.S. consumer credit card business in 2017.

Noninterest expense decreased $1.5 billion to $2.6 billion primarily due to lower non-core mortgage costs and reduced operational costs from the sale of the non-U.S. consumer credit card business. Also, the prior-year period included a $316 million impairment charge related to certain data centers.

The income tax benefit was $2.7 billion in 2018 compared to a benefit of $1.0 billion in 2017. The increase in the tax benefit was primarily driven by a charge of $1.9 billion in 2017 related to impacts of the Tax Act for the lower valuation of certain deferred tax assets and liabilities. Both periods included income tax benefit adjustments to eliminate the FTE treatment of certain tax credits recorded in *Global Banking*.

Off-Balance Sheet Arrangements and Contractual Obligations

We have contractual obligations to make future payments on debt and lease agreements. Additionally, in the normal course of business, we enter into contractual arrangements whereby we commit to future purchases of products or services from unaffiliated parties. Purchase obligations are defined as obligations that are legally binding agreements whereby we agree to purchase products or services with a specific minimum quantity at a fixed, minimum or variable price over a specified period of time. Included in purchase obligations are vendor contracts, the most significant of which include communication services, processing services and software contracts. Debt, lease and other obligations are more fully discussed in *Note 11 – Long-term Debt* and *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements.

Other long-term liabilities include our contractual funding obligations related to the Non-U.S. Pension Plans and Nonqualified and Other Pension Plans (together, the Plans). Obligations to the Plans are based on the current and projected obligations of the Plans, performance of the Plans' assets, and any participant contributions, if applicable. During 2018 and 2017, we contributed $156 million and $514 million to the Plans, and we expect to make $127 million of contributions during 2019. The Plans are more fully discussed in *Note 17 – Employee Benefit Plans* to the Consolidated Financial Statements.

We enter into commitments to extend credit such as loan commitments, standby letters of credit (SBLCs) and commercial letters of credit to meet the financing needs of our customers. For a summary of the total unfunded, or off-balance sheet, credit extension commitment amounts by expiration date, see Credit Extension Commitments in *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements.

We also utilize variable interest entities (VIEs) in the ordinary course of business to support our financing and investing needs as well as those of our customers. For more information on our involvement with unconsolidated VIEs, see *Note 7 – Securitizations and Other Variable Interest Entities* to the Consolidated Financial Statements.

Table 12 includes certain contractual obligations at December 31, 2018 and 2017.

Table 12 Contractual Obligations

(Dollars in millions)	**December 31, 2018**					December 31 2017
	Due in One	**Due After One Year**	**Due After Three**	**Due After Five Years**	**Total**	Total

	Year or Less	**Through Three Years**	**Years Through Five Years**			
Long-term debt	$ 37,975	$ 43,685	$ 41,603	$ 106,077	**$ 229,340**	$ 227,402
Operating lease obligations	2,370	4,197	3,043	6,160	**15,770**	14,520
Purchase obligations	1,288	1,162	507	1,091	**4,048**	4,219
Time deposits	53,482	5,477	1,473	607	**61,039**	67,844
Other long-term liabilities	1,611	1,049	729	544	**3,933**	4,972
Estimated interest expense on long-term debt and time deposits (1)	6,795	10,778	8,407	30,872	**56,852**	49,123
Total contractual obligations	$ 103,521	$ 66,348	$ 55,762	$ 145,351	**$ 370,982**	$ 368,080

(1) Represents forecasted net interest expense on long-term debt and time deposits based on interest rates at December 31, 2018 and 2017. Forecasts are based on the contractual maturity dates of each liability, and are net of derivative hedges, where applicable.

Representations and Warranties Obligations

For more information on representations and warranties obligations in connection with the sale of mortgage loans, see *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements. For more information related to the sensitivity of the assumptions used to estimate our reserve for representations and warranties, see Complex Accounting Estimates – Representations and Warranties Liability on page 79.

Managing Risk

Overview

Risk is inherent in all our business activities. Sound risk management enables us to serve our customers and deliver for our shareholders. If not managed well, risks can result in financial loss, regulatory sanctions and penalties, and damage to our reputation, each of which may adversely impact our ability to execute our business strategies. We take a comprehensive approach to risk management with a defined Risk Framework and an articulated Risk Appetite Statement which are approved annually by the Enterprise Risk Committee (ERC) and the Board.

The seven key types of risk faced by the Corporation are strategic, credit, market, liquidity, compliance, operational and reputational.

- Strategic risk is the risk resulting from incorrect assumptions about external or internal factors, inappropriate business plans, ineffective business strategy execution, or failure to respond in a timely manner to changes in the regulatory, macroeconomic or competitive environments in the geographic locations in which we operate.
- Credit risk is the risk of loss arising from the inability or failure of a borrower or counterparty to meet its obligations.
- Market risk is the risk that changes in market conditions may adversely impact the value of assets or liabilities, or otherwise negatively impact earnings.
- Liquidity risk is the inability to meet expected or unexpected cash flow and collateral needs while continuing to support our businesses and customers under a range of economic conditions.
- Compliance risk is the risk of legal or regulatory sanctions, material financial loss or damage to the reputation of the Corporation arising from the failure of the Corporation to comply with the requirements of applicable laws, rules and regulations and our internal policies and procedures.
- Operational risk is the risk of loss resulting from inadequate or failed processes, people and systems, or from external events.
- Reputational risk is the risk that negative perceptions of the Corporation’s conduct or business practices may adversely impact its profitability or operations.

The following sections address in more detail the specific procedures, measures and analyses of the major categories of risk. This discussion of managing risk focuses on the current Risk Framework that, as part of its annual review process, was approved by the ERC and the Board.

As set forth in our Risk Framework, a culture of managing risk well is fundamental to fulfilling our purpose and our values and delivering responsible growth. It requires us to focus on risk in all activities and encourages the necessary mindset and behavior to enable effective risk management, and promotes sound risk-taking

within our risk appetite. Sustaining a culture of managing risk well throughout the organization is critical to our success and is a clear expectation of our executive management team and the Board.

Our Risk Framework serves as the foundation for the consistent and effective management of risks facing the Corporation. The Risk Framework sets forth clear roles, responsibilities and accountability for the management of risk and provides a blueprint for how the Board, through delegation of authority to committees and executive officers, establishes risk appetite and associated limits for our activities.

Executive management assesses, with Board oversight, the risk-adjusted returns of each business. Management reviews and approves the strategic and financial operating plans, as well as the capital plan and Risk Appetite Statement, and recommends them annually to the Board for approval. Our strategic plan takes into consideration return objectives and financial resources, which must align with risk capacity and risk appetite. Management sets financial objectives for each business by allocating capital and setting a target for return on capital for each business. Capital allocations and operating limits are regularly evaluated as part of our overall governance processes as the businesses and the economic environment in which we operate continue to evolve. For more information regarding capital allocations, see Business Segment Operations on page 30.

The Corporation’s risk appetite indicates the amount of capital, earnings or liquidity we are willing to put at risk to achieve our strategic objectives and business plans, consistent with applicable regulatory requirements. Our risk appetite provides a common and comparable set of measures for senior management and the Board to clearly indicate our aggregate level of risk and to monitor whether the Corporation’s risk profile remains in alignment with our strategic and capital plans. Our risk appetite is formally articulated in the Risk Appetite Statement, which includes both qualitative components and quantitative limits.

Our overall capacity to take risk is limited; therefore, we prioritize the risks we take in order to maintain a strong and flexible financial
position so we can withstand challenging economic conditions and take advantage of organic growth opportunities. Therefore, we set objectives and targets for capital and liquidity that are intended to permit us to continue to operate in a safe and sound manner, including during periods of stress.

Our lines of business operate with risk limits (which may include credit, market and/or operational limits, as applicable) that align with the Corporation's risk appetite. Executive management is responsible for tracking and reporting performance measurements as well as any exceptions to guidelines or limits. The Board, and its committees when appropriate, oversees financial performance, execution of the strategic and financial operating plans, adherence to risk appetite limits and the adequacy of internal controls.

For a more detailed discussion of our risk management activities, see the discussion below and pages 43 through 77.

Risk Management Governance

The Risk Framework describes delegations of authority whereby the Board and its committees may delegate authority to management-level committees or executive officers. Such delegations may authorize certain decision-making and approval functions, which may be evidenced in, for example, committee charters, job descriptions, meeting minutes and resolutions.

The chart below illustrates the inter-relationship among the Board, Board committees and management committees that have the majority of risk oversight responsibilities for the Corporation.

(1) This presentation does not include committees for other legal entities.

(2) Reports to the CEO and CFO with oversight by the Audit Committee.

Board of Directors and Board Committees

The Board is composed of 16 directors, all but one of whom are independent. The Board authorizes management to maintain an effective Risk Framework, and oversees compliance with safe and sound banking practices. In addition, the Board or its committees conduct inquiries of, and receive reports from management on risk-related matters to assess scope or resource limitations that could impede the ability of Independent Risk Management (IRM) and/or Corporate Audit to execute its responsibilities. The Board committees discussed below have the principal responsibility for enterprise-wide oversight of our risk management activities. Through these activities, the Board and applicable committees are provided with information on our risk profile and oversee executive management addressing key risks we face. Other Board committees, as described below, provide additional oversight of specific risks.

Each of the committees shown on the above chart regularly reports to the Board on risk-related matters within the committee’s responsibilities, which is intended to collectively provide the Board with integrated insight about our management of enterprise-wide risks.

Audit Committee

The Audit Committee oversees the qualifications, performance and independence of the Independent Registered Public Accounting Firm, the performance of our corporate audit function, the integrity of our consolidated financial statements, our compliance with legal and regulatory requirements, and makes inquiries of management or the Corporate General Auditor (CGA) to determine whether there are scope or resource limitations that impede the ability of Corporate Audit to execute its responsibilities. The Audit Committee is also responsible for overseeing compliance risk pursuant to the New York Stock Exchange listing standards.

Enterprise Risk Committee

The ERC has primary responsibility for oversight of the Risk Framework and key risks we face and of the Corporation’s overall risk appetite. It approves the Risk Framework and the Risk Appetite Statement and further recommends these documents to the Board for approval. The ERC oversees senior management’s

responsibilities for the identification, measurement, monitoring and control of key risks we face. The ERC may consult with other Board committees on risk-related matters.

Other Board Committees

Our Corporate Governance Committee oversees our Board’s governance processes, identifies and reviews the qualifications of potential Board members, recommends nominees for election to our Board, recommends committee appointments for Board approval and reviews our Environmental, Social and Governance and stockholder engagement activities.

Our Compensation and Benefits Committee oversees establishing, maintaining and administering our compensation programs and employee benefit plans, including approving and recommending our Chief Executive Officer’s (CEO) compensation to our Board for further approval by all independent directors, and reviewing and approving all of our executive officers’ compensation, as well as compensation for non-management directors.

Management Committees

Management committees may receive their authority from the Board, a Board committee, another management committee or from one or more executive officers. Our primary management-level risk committee is the Management Risk Committee (MRC). Subject to Board oversight, the MRC is responsible for management oversight of key risks facing the Corporation. This includes providing management oversight of our compliance and operational risk programs, balance sheet and capital management, funding activities and other liquidity activities, stress testing, trading activities, recovery and resolution planning, model risk, subsidiary governance and activities between member banks and their nonbank affiliates pursuant to Federal Reserve rules and regulations, among other things.

Lines of Defense

We have clear ownership and accountability across three lines of defense: Front Line Units (FLUs), IRM and Corporate Audit. We also have control functions outside of FLUs and IRM (e.g., Legal and Global Human Resources). The three lines of defense are integrated into our management-level governance structure. Each of these functional roles is described in more detail below.

Executive Officers

Executive officers lead various functions representing the functional roles. Authority for functional roles may be delegated to executive officers from the Board, Board committees or management-level committees. Executive officers, in turn, may further delegate responsibilities, as appropriate, to management-level committees, management routines or individuals. Executive officers review our activities for consistency with our Risk Framework, Risk Appetite Statement and applicable strategic, capital and financial operating plans, as well as applicable policies, standards, procedures and processes. Executive officers and other employees make decisions individually on a day-to-day basis, consistent with the authority they have been delegated. Executive officers and other employees may also serve on committees and participate in committee decisions.

Front Line Units

FLUs, which include the lines of business as well as the Global Technology and Operations Group, are responsible for appropriately assessing and effectively managing all of the risks associated with their activities.

Three organizational units that include FLU activities and control function activities, but are not part of IRM are the Chief Financial Officer (CFO) Group, Global Marketing and Corporate Affairs (GM&CA) and the Chief Administrative Officer (CAO) Group.

Independent Risk Management

IRM is part of our control functions and includes Global Risk Management and Global Compliance and Operational Risk. We have other control functions that are not part of IRM (other control functions may also provide oversight to FLU activities), including Legal, Global Human Resources and certain activities within the CAO Group, CFO Group and GM&CA. IRM, led by the Chief Risk Officer (CRO), is responsible for independently assessing and overseeing risks within FLUs and other control functions. IRM establishes written enterprise policies and procedures that include concentration risk limits, where appropriate. Such policies and procedures outline how aggregate risks are identified, measured, monitored and controlled.

The CRO has the stature, authority and independence to develop and implement a meaningful risk management framework. The CRO has unrestricted access to the Board and reports directly to both the ERC and to the CEO. Global Risk Management is organized into horizontal risk teams, front line unit risk teams and control function risk teams that work collaboratively in executing their respective duties.

Corporate Audit

Corporate Audit and the CGA maintain their independence from the FLUs, IRM and other control functions by reporting directly to the Audit Committee or the Board. The CGA administratively reports to the CEO. Corporate Audit provides independent assessment and validation through testing of key processes and controls across the Corporation. Corporate Audit includes Credit Review which periodically tests and examines credit portfolios and processes.

Risk Management Processes

The Risk Framework requires that strong risk management practices are integrated in key strategic, capital and financial planning processes and in day-to-day business processes across

the Corporation, with a goal of ensuring risks are appropriately considered, evaluated and responded to in a timely manner.

We employ our risk management process, referred to as Identify, Measure, Monitor and Control, as part of our daily activities.

Identify – To be effectively managed, risks must be clearly defined and proactively identified. Proper risk identification focuses on recognizing and understanding key risks inherent in our business activities or key risks that may arise from external factors. Each employee is expected to identify and escalate risks promptly. Risk identification is an ongoing process, incorporating input from FLUs and control functions, designed to be forward looking and capture relevant risk factors across all of our lines of business.

Measure – Once a risk is identified, it must be prioritized and accurately measured through a systematic risk quantification process including quantitative and qualitative components. Risk is measured at various levels including, but not limited to, risk type, FLU, legal entity and on an aggregate basis. This risk quantification process helps to capture changes in our risk profile due to changes in strategic direction, concentrations, portfolio quality and the overall economic environment. Senior management considers how risk exposures might evolve under a variety of stress scenarios.

Monitor – We monitor risk levels regularly to track adherence to risk appetite, policies, standards, procedures and processes. We also regularly update risk assessments and review risk exposures. Through our monitoring, we can determine our level of risk relative to limits and can take action in a timely manner. We also can determine when risk limits are breached and have processes to appropriately report and escalate exceptions. This includes requests for approval to managers and alerts to executive management, management-level committees or the Board (directly or through an appropriate committee).

Control – We establish and communicate risk limits and controls through policies, standards, procedures and processes that define the responsibilities and authority for risk-taking. The limits and controls can be adjusted by the Board or management when conditions or risk tolerances warrant. These limits may be absolute (e.g., loan amount, trading volume) or relative (e.g., percentage of loan book in higher-risk categories). Our lines of business are held accountable to perform within the established limits.

The formal processes used to manage risk represent a part of our overall risk management process. We instill a strong and comprehensive culture of managing risk well through communications, training, policies, procedures and organizational roles and responsibilities. Establishing a culture reflective of our purpose to help make our customers' financial lives better and delivering our responsible growth strategy are also critical to effective risk management. We understand that improper actions, behaviors or practices that are illegal, unethical or contrary to our core values could result in harm to the Corporation, our shareholders or our customers, damage the integrity of the financial markets, or negatively impact our reputation, and have established protocols and structures so that such conduct risk is governed and reported across the Corporation. Specifically, our Code of Conduct provides a framework for all of our employees to conduct themselves with the highest integrity. Additionally, we continue to strengthen the link between the employee performance management process and individual compensation to encourage employees to work toward enterprise-wide risk goals.

Corporation-wide Stress Testing

Integral to our Capital Planning, Financial Planning and Strategic Planning processes, we conduct capital scenario management and stress forecasting on a periodic basis to better understand balance sheet, earnings and capital sensitivities to certain economic and business scenarios, including economic and market conditions that are more severe than anticipated. These stress forecasts provide an understanding of the potential impacts from our risk profile on the balance sheet, earnings and capital, and serve as a key component of our capital and risk management practices. The intent of stress testing is to develop a comprehensive understanding of potential impacts of on- and off-balance sheet risks at the Corporation and how they impact financial resiliency, which provides confidence to management, regulators and our investors.

Contingency Planning

We have developed and maintain contingency plans that are designed to prepare us in advance to respond in the event of potential adverse economic, financial or market stress. These contingency plans include our Capital Contingency Plan and Financial Contingency and Recovery Plan, which provide monitoring, escalation, actions and routines designed to enable us to increase capital, access funding sources and reduce risk through consideration of potential options that include asset sales, business sales, capital or debt issuances, or other de-risking strategies. We also maintain a Resolution Plan to limit adverse systemic impacts that could be associated with a potential resolution of Bank of America.

Strategic Risk Management

Strategic risk is embedded in every business and is one of the major risk categories along with credit, market, liquidity, compliance, operational and reputational risks. This risk results from incorrect assumptions about external or internal factors, inappropriate business plans, ineffective business strategy execution, or failure to respond in a timely manner to changes in the regulatory, macroeconomic or competitive environments, in the geographic locations in which we operate, such as competitor actions, changing customer preferences, product obsolescence and technology developments. Our strategic plan is consistent with our risk appetite, capital plan and liquidity requirements, and specifically addresses strategic risks.

On an annual basis, the Board reviews and approves the strategic plan, capital plan, financial operating plan and Risk Appetite Statement. With oversight by the Board, executive management directs the lines of business to execute our strategic plan consistent with our core operating principles and risk appetite. The executive management team monitors business performance throughout the year and provides the Board with regular progress reports on whether strategic objectives and timelines are being met, including reports on strategic risks and if additional or alternative actions need to be considered or implemented. The regular executive reviews focus on assessing forecasted earnings and returns on capital, the current risk profile, current capital and liquidity requirements, staffing levels and changes required to support the strategic plan, stress testing results, and other qualitative factors such as market growth rates and peer analysis.

Significant strategic actions, such as capital actions, material acquisitions or divestitures, and resolution plans are reviewed and approved by the Board. At the business level, processes are in place to discuss the strategic risk implications of new, expanded or modified businesses, products or services and other strategic initiatives, and to provide formal review and approval where required. With oversight by the Board and the ERC, executive management performs similar analyses throughout the year, and evaluates changes to the financial forecast or the risk, capital or liquidity positions as deemed appropriate to balance and optimize achieving the targeted risk appetite, shareholder returns and maintaining the targeted financial strength. Proprietary models are used to measure the capital requirements for credit, country, market, operational and strategic risks. The allocated capital assigned to each business is based on its unique risk profile. With oversight by the Board, executive management assesses the risk-adjusted returns of each business in approving strategic and financial operating plans. The businesses use allocated capital to define business strategies, and price products and transactions.

Capital Management

The Corporation manages its capital position so that its capital is more than adequate to support its business activities and aligns with risk, risk appetite and strategic planning. Additionally, we seek to maintain safety and soundness at all times, even under adverse scenarios, take advantage of organic growth opportunities, meet obligations to creditors and counterparties, maintain ready access to financial markets, continue to serve as a credit intermediary, remain a source of strength for our subsidiaries, and satisfy current and future regulatory capital requirements. Capital management is integrated into our risk and governance processes, as capital is a key consideration in the development of our strategic plan, risk appetite and risk limits.

We conduct an Internal Capital Adequacy Assessment Process (ICAAP) on a periodic basis. The ICAAP is a forward-looking assessment of our projected capital needs and resources, incorporating earnings, balance sheet and risk forecasts under baseline and adverse economic and market conditions. We utilize periodic stress tests to assess the potential impacts to our balance sheet, earnings, regulatory capital and liquidity under a variety of stress scenarios. We perform qualitative risk assessments to identify and assess material risks not fully captured in our forecasts or stress tests. We assess the potential capital impacts of proposed changes to regulatory capital requirements. Management assesses ICAAP results and provides documented quarterly assessments of the adequacy of our capital guidelines and capital position to the Board or its committees.

We periodically review capital allocated to our businesses and allocate capital annually during the strategic and capital planning processes. For additional information, see Business Segment Operations on page 30.

CCAR and Capital Planning

The Federal Reserve requires BHCs to submit a capital plan and requests for capital actions on an annual basis, consistent with the rules governing the CCAR capital plan.

On June 28, 2018, following the Federal Reserve's non-objection to our 2018 CCAR capital plan, the Board authorized the repurchase of approximately $20.6 billion in common stock from July 1, 2018 through June 30, 2019, which includes approximately $600 million in repurchases to offset shares awarded under equity-based compensation plans during the same period. In addition to the previously announced repurchases associated with the 2018 CCAR capital plan, on February 7, 2019, we announced a plan to repurchase an additional $2.5 billion of common stock through June 30, 2019, which was approved by the Federal Reserve.

During 2018, pursuant to the Board's authorizations, including those related to our 2017 CCAR capital plan that expired June 30, 2018, we repurchased $20.1 billion of common stock, which includes common stock repurchases to offset equity-based

compensation awards. At December 31, 2018, our remaining stock repurchase authorization was $10.3 billion.
Our stock repurchases are subject to various factors, including the Corporation's capital position, liquidity, financial performance and alternative uses of capital, stock trading price and general market conditions, and may be suspended at any time. The repurchases may be effected through open market purchases or privately negotiated transactions, including repurchase plans that satisfy the conditions of Rule 10b5-1 of the Securities Exchange Act of 1934, as amended. As a "well-capitalized" BHC, we may notify the Federal Reserve of our intention to make additional capital distributions not to exceed 0.25 percent of Tier 1 capital, and which were not contemplated in our capital plan, subject to the Federal Reserve's non-objection.

Regulatory Capital

As a financial services holding company, we are subject to regulatory capital rules, including Basel 3, issued by U.S. banking regulators. Basel 3 established minimum capital ratios and buffer requirements and outlined two methods of calculating risk-weighted assets, the Standardized approach and the Advanced approaches. The Standardized approach relies primarily on supervisory risk weights based on exposure type, and the Advanced approaches determine risk weights based on internal models.

The Corporation and its primary affiliated banking entity, BANA, are Advanced approaches institutions under Basel 3 and are required to report regulatory risk-based capital ratios and risk-weighted assets under both the Standardized and Advanced approaches. The approach that yields the lower ratio is used to assess capital adequacy including under the Prompt Corrective Action (PCA) framework. As of December 31, 2018, Common equity tier 1 (CET1) and Tier 1 capital ratios for the Corporation were lower under the Standardized approach whereas the Advanced approaches yielded a lower Total capital ratio.

Minimum Capital Requirements

Minimum capital requirements and related buffers were fully phased in as of January 1, 2019. The PCA framework established categories of capitalization, including well capitalized, based on the Basel 3 regulatory ratio requirements. U.S. banking regulators are required to take certain mandatory actions depending on the category of capitalization, with no mandatory actions required for well-capitalized banking organizations.

In order to avoid restrictions on capital distributions and discretionary bonus payments, the Corporation must meet risk-based capital ratio requirements that include a capital conservation buffer greater than 2.5 percent, plus any applicable countercyclical capital buffer and a global systemically important bank (G-SIB) surcharge. The buffers and surcharge must be comprised solely of CET1 capital and were phased in over a three-year period that ended January 1, 2019.

The Corporation is also required to maintain a minimum supplementary leverage ratio (SLR) of 3.0 percent plus a leverage buffer of 2.0 percent in order to avoid certain restrictions on capital distributions and discretionary bonus payments. Our insured depository institution subsidiaries are required to maintain a minimum 6.0 percent SLR to be considered well capitalized under the PCA framework. The numerator of the SLR is quarter-end Basel 3 Tier 1 capital. The denominator is total leverage exposure based on the daily average of the sum of on-balance sheet exposures less permitted Tier 1 deductions, as well as the simple average of certain off-balance sheet exposures, as of the end of each month in a quarter.

Capital Composition and Ratios

Table 13 presents Bank of America Corporation's capital ratios and related information in accordance with Basel 3 Standardized and Advanced approaches as measured at December 31, 2018 and 2017. As of the periods presented, the Corporation met the definition of well capitalized under current regulatory requirements.

Table 13 **Bank of America Corporation Regulatory Capital under Basel 3** [1]

(Dollars in millions, except as noted)	Standardized Approach		Advanced Approaches		Current Regulatory Minimum [2]		2019 Regulatory Minimum [3]	
	December 31, 2018							
Risk-based capital metrics:								
Common equity tier 1 capital	**$ 167,272**		**$ 167,272**					
Tier 1 capital	**189,038**		**189,038**					
Total capital [4]	**221,304**		**212,878**					
Risk-weighted assets (in billions)	**1,437**		**1,409**					
Common equity tier 1 capital ratio	**11.6**	**%**	**11.9**	**%**	**8.25**	**%**	**9.5**	**%**
Tier 1 capital ratio	**13.2**		**13.4**		**9.75**		**11.0**	
Total capital ratio	**15.4**		**15.1**		**11.75**		**13.0**	
Leverage-based metrics:								
Adjusted quarterly average assets (in billions) [5]	**$ 2,258**		**$ 2,258**					
Tier 1 leverage ratio	**8.4**	**%**	**8.4**	**%**	**4.0**		**4.0**	
SLR leverage exposure (in billions)			**$ 2,791**					
SLR			**6.8**	**%**	**5.0**		**5.0**	
	December 31, 2017							
Risk-based capital metrics:								
Common equity tier 1 capital	$ 168,461		$ 168,461					
Tier 1 capital	190,189		190,189					
Total capital [4]	224,209		215,311					
Risk-weighted assets (in billions)	1,443		1,459					
	11.7	%	11.5	%	7.25	%	9.5	%

Common equity tier 1 capital ratio				
Tier 1 capital ratio	13.2	13.0	8.75	11.0
Total capital ratio	15.5	14.8	10.75	13.0
Leverage-based metrics:				
Adjusted quarterly average assets (in billions) (5)	$ 2,223	$ 2,223		
Tier 1 leverage ratio	8.6 %	8.6 %	4.0	4.0

(1) Basel 3 transition provisions for regulatory capital adjustments and deductions were fully phased in as of January 1, 2018. Prior periods are presented on a fully phased-in basis.

(2) The December 31, 2018 and 2017 amounts include a transition capital conservation buffer of 1.875 percent and 1.25 percent and a transition G-SIB surcharge of 1.875 percent and 1.5 percent. The countercyclical capital buffer for both periods is zero.

(3) The 2019 regulatory minimums include a capital conservation buffer of 2.5 percent and G-SIB surcharge of 2.5 percent. The countercyclical capital buffer is zero. We became subject to these regulatory minimums on January 1, 2019. The SLR minimum includes a leverage buffer of 2.0 percent and was applicable beginning on January 1, 2018.

(4) Total capital under the Advanced approaches differs from the Standardized approach due to differences in the amount permitted in Tier 2 capital related to the qualifying allowance for credit losses.

(5) Reflects adjusted average total assets for the three months ended December 31, 2018 and 2017.

CET1 capital was $167.3 billion at December 31, 2018, a decrease of $1.2 billion from December 31, 2017, driven by common stock repurchases, dividends and market value declines on AFS debt securities included in accumulated OCI, partially offset by earnings. During 2018, Total capital under the Advanced approaches decreased $2.4 billion driven by the same factors as CET1 capital and a decrease in subordinated debt included in Tier

2 capital. Standardized risk-weighted assets, which yielded the lower CET1 capital ratio for December 31, 2018, decreased $5.5 billion during 2018 to $1,437 billion primarily due to sales of non-core mortgage loans and a decrease in market risk, partially offset by an increase in commercial loans.

Table 14 shows the capital composition at December 31, 2018 and 2017.

Table 14 Capital Composition under Basel 3 (1)

	December 31	
(Dollars in millions)	**2018**	2017
Total common shareholders’ equity	**$ 242,999**	$ 244,823
Goodwill, net of related deferred tax liabilities	**(68,572)**	(68,576)
Deferred tax assets arising from net operating loss and tax credit carryforwards	**(5,981)**	(6,555)
Intangibles, other than mortgage servicing rights and goodwill, net of related deferred tax liabilities	**(1,294)**	(1,743)
Other	**120**	512
Common equity tier 1 capital	**167,272**	168,461
Qualifying preferred stock, net of issuance cost	**22,326**	22,323
Other	**(560)**	(595)
Tier 1 capital	**189,038**	190,189
Tier 2 capital instruments	**21,887**	22,938
Eligible credit reserves included in Tier 2 capital	**1,972**	2,272
Other	**(19)**	(88)
Total capital under the Advanced approaches	**$ 212,878**	$ 215,311

(1) Basel 3 transition provisions for regulatory capital adjustments and deductions were fully phased in as of January 1, 2018. Prior periods are presented on a fully phased-in basis.

Table 15 shows the components of risk-weighted assets as measured under Basel 3 at December 31, 2018 and 2017.

Table 15 Risk-weighted Assets under Basel 3 [1]

(Dollars in billions)	**Standardized Approach**	**Advanced Approaches**	Standardized Approach	Advanced Approaches
	December 31			
	2018		2017	
Credit risk	**$ 1,384**	**$ 827**	$ 1,384	$ 867
Market risk	**53**	**52**	59	58
Operational risk	**n/a**	**500**	n/a	500
Risks related to credit valuation adjustments	**n/a**	**30**	n/a	34
Total risk-weighted assets	**$ 1,437**	**$ 1,409**	$ 1,443	$ 1,459

(1) Basel 3 transition provisions for regulatory capital adjustments and deductions were fully phased in as of January 1, 2018. Prior periods are presented on a fully phased-in basis.
n/a = not applicable

Bank of America, N.A. Regulatory Capital

Table 16 presents regulatory capital information for BANA in accordance with Basel 3 Standardized and Advanced approaches as measured at December 31, 2018 and 2017. BANA met the definition of well capitalized under the PCA framework for both periods.

Table 16 Bank of America, N.A. Regulatory Capital under Basel 3

(Dollars in millions)	**Standardized Approach Ratio**	**Standardized Approach Amount**	**Advanced Approaches Ratio**	**Advanced Approaches Amount**	**Minimum Required [1]**
	December 31, 2018				
Common equity tier 1 capital	**12.5%**	**$ 149,824**	**15.6%**	**$ 149,824**	**6.5 %**
Tier 1 capital	**12.5**	**149,824**	**15.6**	**149,824**	**8.0**
Total capital	**13.5**	**161,760**	**16.0**	**153,627**	**10.0**
Tier 1 leverage	**8.7**	**149,824**	**8.7**	**149,824**	**5.0**
SLR			**7.1**	**149,824**	**6.0**
	December 31, 2017				
Common equity tier 1 capital	12.5 %	$ 150,552	14.9 %	$ 150,552	6.5 %
Tier 1 capital	12.5	150,552	14.9	150,552	8.0
Total capital	13.6	163,243	15.4	154,675	10.0
Tier 1 leverage	9.0	150,552	9.0	150,552	5.0

(1) Percent required to meet guidelines to be considered well capitalized under the PCA framework.

Regulatory Developments

Minimum Total Loss-Absorbing Capacity

The Federal Reserve's final rule, which was effective January 1, 2019, includes minimum external total loss-absorbing capacity (TLAC) and long-term debt requirements to improve the resolvability and resiliency of large, interconnected BHCs. As of December 31, 2018, the Corporation's TLAC and long-term debt exceeded our estimated 2019 minimum requirements.

Stress Buffer Requirements

On April 10, 2018, the Federal Reserve announced a proposal to integrate the annual quantitative assessment of the CCAR program with the buffer requirements in the Basel 3 capital rule by introducing stress buffer requirements as a replacement of the CCAR quantitative objection. Under the Standardized approach, the proposal replaces the existing static 2.5 percent capital conservation buffer with a stress capital buffer, calculated as the decrease in the CET1 capital ratio in the supervisory severely adverse scenario of the modified CCAR stress test plus four quarters of planned common stock dividend payments, floored at 2.5 percent. The static 2.5 percent capital conservation buffer would be retained under the Advanced approaches. The proposal also introduces a stress leverage buffer requirement which would be calculated as the decrease in the Tier 1 leverage ratio in the supervisory severely adverse scenario of the modified CCAR stress test plus four quarters of planned common stock dividends, with

no floor. The SLR would not incorporate a stress buffer requirement. The proposal also updates the capital distribution assumptions used in the CCAR stress test to better align with a firm’s expected actions in stress, notably removing the assumption that a BHC will carry out all of its planned capital actions under stress.

Enhanced Supplementary Leverage Ratio and TLAC Requirements

On April 11, 2018, the Federal Reserve and Office of the Comptroller of the Currency announced a proposal to modify the enhanced SLR standards applicable to U.S. G-SIBs and their insured depository institution subsidiaries. The proposal replaces the existing 2.0 percent leverage buffer with a leverage buffer tailored to each G-SIB, set at 50 percent of the applicable G-SIB surcharge. This proposal also replaces the current 6.0 percent threshold at which a G-SIB’s insured depository institution subsidiaries are considered well capitalized under the PCA framework with a threshold set at 3.0 percent plus 50 percent of the G-SIB surcharge applicable to the subsidiary’s G-SIB holding company. Correspondingly, the proposal updates the external TLAC leverage buffer for each G-SIB to 50 percent of the applicable G-SIB surcharge and revises the leverage component of the minimum external long-term debt requirement from 4.5 percent to 2.5 percent plus 50 percent of the applicable G-SIB surcharge.

Revisions to Basel 3 to Address Current Expected Credit Loss Accounting

On December 18, 2018, the U.S. banking regulators issued a final rule to address the regulatory capital impact of using the current expected credit loss methodology to measure credit reserves under a new accounting standard that is effective on January 1, 2020. For more information on this standard, see *Note 1 – Summary of Significant Accounting Principles* to the Consolidated Financial Statements. The final rule provides an option to phase in the impact to regulatory capital over a three-year period on a straight-line basis. It also updates the existing regulatory capital framework by creating a new defined term, adjusted allowance for credit losses, which would include credit losses on all financial instruments measured at amortized cost with the exception of purchased credit-deteriorated assets. The final rule continues to allow a limited amount of credit losses to be recognized in Tier 2 capital and maintains the existing limits under the Standardized and Advanced approaches.

Single-Counterparty Credit Limits

On June 14, 2018, the Federal Reserve published a final rule establishing single-counterparty credit limits (SCCL) for BHCs with total consolidated assets of $250 billion or more. The SCCL rule is designed to ensure that the maximum possible loss that a BHC could incur due to the default of a single counterparty or a group of connected counterparties would not endanger the BHC's survival, thereby reducing the probability of future financial crises. Beginning January 1, 2020, G-SIBs must calculate SCCL on a daily basis by dividing the aggregate net credit exposure to a given counterparty by the G-SIB's Tier 1 capital, ensuring that exposures to other G-SIBs and nonbank financial institutions regulated by the Federal Reserve do not breach 15 percent of Tier 1 capital and exposures to most other counterparties do not breach 25 percent of Tier 1 capital. Certain exposures, including exposures to the U.S. government, U.S. government-sponsored entities and qualifying central counterparties, are exempt from the credit limits.

Broker-dealer Regulatory Capital and Securities Regulation

The Corporation's principal U.S. broker-dealer subsidiaries are Merrill Lynch, Pierce, Fenner & Smith Incorporated (MLPF&S) and Merrill Lynch Professional Clearing Corp (MLPCC). MLPCC is a fully-guaranteed subsidiary of MLPF&S and provides clearing and settlement services. Both entities are subject to the net capital requirements of Securities and Exchange Commission (SEC) Rule 15c3-1. Both entities are also registered as futures commission merchants and are subject to the Commodity Futures Trading Commission Regulation 1.17.

MLPF&S has elected to compute the minimum capital requirement in accordance with the Alternative Net Capital Requirement as permitted by SEC Rule 15c3-1. At December 31, 2018, MLPF&S' regulatory net capital as defined by Rule 15c3-1 was $13.4 billion and exceeded the minimum requirement of $2.0 billion by $11.4 billion. MLPCC's net capital of $4.4 billion exceeded the minimum requirement of $617 million by $3.8 billion.

In accordance with the Alternative Net Capital Requirements, MLPF&S is required to maintain tentative net capital in excess of $1.0 billion, net capital in excess of $500 million and notify the SEC in the event its tentative net capital is less than $5.0 billion. At December 31, 2018, MLPF&S had tentative net capital and net capital in excess of the minimum and notification requirements.

As a result of resolution planning, the current business of MLPF&S is expected to be reorganized into two affiliated broker-

dealers: MLPF&S and BofA Securities, Inc., a newly formed broker-dealer. Under the contemplated reorganization, which is expected to occur during 2019, BofA Securities, Inc. would become the legal entity for the institutional services that are now provided by MLPF&S. MLPF&S' retail services would remain with MLPF&S. The contemplated reorganization is subject to regulatory approval. For more information on resolution planning, see Item 1. Business. –.Resolution Planning.

Merrill Lynch International (MLI), a U.K. investment firm, is regulated by the Prudential Regulation Authority and the FCA, and is subject to certain regulatory capital requirements. At December 31, 2018, MLI's capital resources were $35.0 billion, which exceeded the minimum Pillar 1 requirement of $12.7 billion.

Liquidity Risk

Funding and Liquidity Risk Management

Our primary liquidity risk management objective is to meet expected or unexpected cash flow and collateral needs while continuing to support our businesses and customers under a range of economic conditions. To achieve that objective, we analyze and monitor our liquidity risk under expected and stressed conditions, maintain liquidity and access to diverse funding sources, including our stable deposit base, and seek to align liquidity-related incentives and risks.

We define liquidity as readily available assets, limited to cash and high-quality, liquid, unencumbered securities that we can use to meet our contractual and contingent financial obligations as those obligations arise. We manage our liquidity position through line of business and ALM activities, as well as through our legal entity funding strategy, on both a forward and current (including intraday) basis under both expected and stressed conditions. We believe that a centralized approach to funding and liquidity management enhances our ability to monitor liquidity requirements, maximizes access to funding sources, minimizes borrowing costs and facilitates timely responses to liquidity events.

The Board approves our liquidity risk policy and the Financial Contingency and Recovery Plan. The ERC establishes our liquidity risk tolerance levels. The MRC is responsible for overseeing liquidity risks and directing management to maintain exposures within the established tolerance levels. The MRC reviews and monitors our liquidity position and stress testing results, approves certain liquidity risk limits and reviews the impact of strategic decisions on our liquidity. For more information, see Managing Risk on page 40. Under this governance framework, we have developed certain funding and liquidity risk management practices which include: maintaining liquidity at the parent company and selected subsidiaries, including our bank subsidiaries and other regulated entities; determining what amounts of liquidity are appropriate for these entities based on analysis of debt maturities and other potential cash outflows, including those that we may experience during stressed market conditions; diversifying funding sources, considering our asset profile and legal entity structure; and performing contingency planning.

NB Holdings Corporation

We have intercompany arrangements with certain key subsidiaries under which we transferred certain assets of Bank of America Corporation, as the parent company, which is a separate and distinct legal entity from our banking and nonbank subsidiaries, and agreed to transfer certain additional parent company assets not needed to satisfy anticipated near-term expenditures, to NB Holdings Corporation, a wholly-owned holding company subsidiary

(NB Holdings). The parent company is expected to continue to have access to the same flow of dividends, interest and other amounts of cash necessary to service its debt, pay dividends and perform other obligations as it would have had if it had not entered into these arrangements and transferred any assets.
In consideration for the transfer of assets, NB Holdings issued a subordinated note to the parent company in a principal amount equal to the value of the transferred assets. The aggregate principal amount of the note will increase by the amount of any future asset transfers. NB Holdings also provided the parent company with a committed line of credit that allows the parent company to draw funds necessary to service near-term cash needs. These arrangements support our preferred single point of entry resolution strategy, under which only the parent company would be resolved under the U.S. Bankruptcy Code. These arrangements include provisions to terminate the line of credit, forgive the subordinated note and require the parent company to transfer its remaining financial assets to NB Holdings if our projected liquidity resources deteriorate so severely that resolution of the parent company becomes imminent.

Global Liquidity Sources and Other Unencumbered Assets

We maintain liquidity available to the Corporation, including the parent company and selected subsidiaries, in the form of cash and high-quality, liquid, unencumbered securities. Our liquidity buffer, referred to as Global Liquidity Sources (GLS), is comprised of assets that are readily available to the parent company and selected subsidiaries, including holding company, bank and broker-dealer subsidiaries, even during stressed market conditions. Our cash is primarily on deposit with the Federal Reserve Bank and, to a lesser extent, central banks outside of the U.S. We limit the composition of high-quality, liquid, unencumbered securities to U.S. government securities, U.S. agency securities, U.S. agency MBS and a select group of non-U.S. government securities. We can quickly obtain cash for these securities, even in stressed conditions, through repurchase agreements or outright sales. We hold our GLS in legal entities that allow us to meet the liquidity requirements of our global businesses, and we consider the impact of potential regulatory, tax, legal and other restrictions that could limit the transferability of funds among entities.
Table 17 presents average GLS for the three months ended December 31, 2018 and 2017.

Table 17 Average Global Liquidity Sources

	Three Months Ended December 31	
(Dollars in billions)	**2018**	2017
Parent company and NB Holdings	**$ 76**	$ 79
Bank subsidiaries	**420**	394
Other regulated entities	**48**	49
Total Average Global Liquidity Sources	**$ 544**	$ 522

Typically, parent company and NB Holdings liquidity is in the form of cash deposited with BANA.
Our bank subsidiaries' liquidity is primarily driven by deposit and lending activity, as well as securities valuation and net debt activity. Liquidity at bank subsidiaries excludes the cash deposited by the parent company and NB Holdings. Our bank subsidiaries can also generate incremental liquidity by pledging a range of unencumbered loans and securities to certain FHLBs and the Federal Reserve Discount Window. The cash we could have obtained by borrowing against this pool of specifically-identified eligible assets was $344 billion and $308 billion at December 31,

2018 and 2017. We have established operational procedures to enable us to borrow against these assets, including regularly monitoring our total pool of eligible loans and securities collateral. Eligibility is defined in guidelines from the FHLBs and the Federal Reserve and is subject to change at their discretion. Due to regulatory restrictions, liquidity generated by the bank subsidiaries can generally be used only to fund obligations within the bank subsidiaries, and transfers to the parent company or nonbank subsidiaries may be subject to prior regulatory approval.

Liquidity held in other regulated entities, comprised primarily of broker-dealer subsidiaries, is primarily available to meet the obligations of that entity and transfers to the parent company or to any other subsidiary may be subject to prior regulatory approval due to regulatory restrictions and minimum requirements. Our other regulated entities also hold unencumbered investment-grade securities and equities that we believe could be used to generate additional liquidity.

Table 18 presents the composition of average GLS for the three months ended December 31, 2018 and 2017.

Table 18 Average Global Liquidity Sources Composition

	Three Months Ended December 31	
(Dollars in billions)	**2018**	2017
Cash on deposit	**$ 113**	$ 118
U.S. Treasury securities	**81**	62
U.S. agency securities and mortgage-backed securities	**340**	330
Non-U.S. government securities	**10**	12
Total Average Global Liquidity Sources	**$ 544**	$ 522

Our GLS are substantially the same in composition to what qualifies as High Quality Liquid Assets (HQLA) under the final U.S. Liquidity Coverage Ratio (LCR) rules. However, HQLA for purposes of calculating LCR is not reported at market value, but at a lower value that incorporates regulatory deductions and the exclusion of excess liquidity held at certain subsidiaries. The LCR is calculated as the amount of a financial institution's unencumbered HQLA relative to the estimated net cash outflows the institution could encounter over a 30-day period of significant liquidity stress, expressed as a percentage. Our average consolidated HQLA, on a net basis, was $446 billion and $439 billion for the three months ended December 31, 2018 and 2017. For the same periods, the average consolidated LCR was 118 percent and 125 percent. Our LCR will fluctuate due to normal business flows from customer activity.

Liquidity Stress Analysis

We utilize liquidity stress analysis to assist us in determining the appropriate amounts of liquidity to maintain at the parent company and our subsidiaries to meet contractual and contingent cash outflows under a range of scenarios. The scenarios we consider and utilize incorporate market-wide and Corporation-specific events, including potential credit rating downgrades for the parent company and our subsidiaries, and more severe events including potential resolution scenarios. The scenarios are based on our historical experience, experience of distressed and failed financial institutions, regulatory guidance, and both expected and unexpected future events. The types of potential contractual and contingent cash outflows we consider in our scenarios may include, but are not limited to, upcoming contractual maturities of unsecured debt and reductions in new debt issuance; diminished access to secured financing markets; potential deposit withdrawals; increased draws on loan commitments, liquidity facilities and letters of credit; additional collateral that counterparties could call if our credit ratings were downgraded; collateral and margin requirements arising from market value changes; and potential liquidity required to maintain businesses and finance customer activities. Changes in certain market factors, including, but not limited to, credit rating downgrades, could negatively impact potential contractual and contingent outflows and the related financial instruments, and in some cases these impacts could be material to our financial results.

We consider all sources of funds that we could access during each stress scenario and focus particularly on matching available sources with corresponding liquidity requirements by legal entity. We also use the stress modeling results to manage our asset and liability profile and establish limits and guidelines on certain funding sources and businesses.

Net Stable Funding Ratio

U.S. banking regulators issued a proposal for a Net Stable Funding Ratio (NSFR) requirement applicable to U.S. financial institutions following the Basel Committee's final standard. The proposed U.S. NSFR would apply to the Corporation on a consolidated basis and to our insured depository institutions. While the final requirement remains pending and is subject to change, if finalized as proposed, we expect to be in compliance within the regulatory timeline. The standard is intended to reduce funding risk over a longer time horizon. The NSFR is designed to provide an appropriate amount of stable funding, generally capital and liabilities maturing beyond one year, given the mix of assets and off-balance sheet items.

Diversified Funding Sources

We fund our assets primarily with a mix of deposits, and secured and unsecured liabilities through a centralized, globally coordinated funding approach diversified across products, programs, markets, currencies and investor groups.

The primary benefits of our centralized funding approach include greater control, reduced funding costs, wider name recognition by investors and greater flexibility to meet the variable funding requirements of subsidiaries. Where regulations, time zone differences or other business considerations make parent company funding impractical, certain other subsidiaries may issue their own debt.

We fund a substantial portion of our lending activities through our deposits, which were $1.38 trillion and $1.31 trillion at December 31, 2018 and 2017. Deposits are primarily generated by our *Consumer Banking*, *GWIM* and *Global Banking* segments. These deposits are diversified by clients, product type and geography, and the majority of our U.S. deposits are insured by the FDIC. We consider a substantial portion of our deposits to be a stable, low-cost and consistent source of funding. We believe this deposit funding is generally less sensitive to interest rate changes, market volatility or changes in our credit ratings than wholesale funding sources. Our lending activities may also be financed through secured borrowings, including credit card securitizations and securitizations with government-sponsored enterprises (GSE), the Federal Housing Administration (FHA) and private-label investors, as well as FHLB loans.

Our trading activities in other regulated entities are primarily funded on a secured basis through securities lending and repurchase agreements, and these amounts will vary based on customer activity and market conditions. We believe funding these activities in the secured financing markets is more cost-efficient and less sensitive to changes in our credit ratings than unsecured financing. Repurchase agreements are generally short-term and often overnight. Disruptions in secured financing markets for financial institutions have occurred in prior market cycles which resulted in adverse changes in terms or significant reductions in the availability of such financing. We manage the liquidity risks arising from secured funding by sourcing funding globally from a diverse group of counterparties, providing a range of securities collateral and pursuing longer durations, when appropriate. For more information on secured financing agreements, see *Note 10 – Federal Funds Sold or Purchased, Securities Financing Agreements, Short-term Borrowings and Restricted Cash* to the Consolidated Financial Statements.

We issue long-term unsecured debt in a variety of maturities and currencies to achieve cost-efficient funding and to maintain an appropriate maturity profile. While the cost and availability of unsecured funding may be negatively impacted by general market conditions or by matters specific to the financial services industry or the Corporation, we seek to mitigate refinancing risk by actively managing the amount of our borrowings that we anticipate will mature within any month or quarter.

Table 19 presents our long-term debt by major currency at December 31, 2018 and 2017.

Table 19 Long-term Debt by Major Currency

December 31

(Dollars in millions)	2018	2017
U.S. dollar	**$ 180,709**	$ 175,623
Euro	**34,296**	35,481
British pound	**5,450**	7,016
Japanese yen	**3,036**	2,993
Canadian dollar	**2,935**	1,966
Australian dollar	**1,722**	3,046
Other	**1,192**	1,277
Total long-term debt	**$ 229,340**	$ 227,402

Total long-term debt increased $1.9 billion during 2018, primarily due to issuances outpacing maturities and redemptions. We may, from time to time, purchase outstanding debt instruments in various transactions, depending on market conditions, liquidity and other factors. Our other regulated entities may also make markets in our debt instruments to provide liquidity for investors. For more information on long-term debt funding, see *Note 11 – Long-term Debt* to the Consolidated Financial Statements.

During 2018, we issued $64.4 billion of long-term debt consisting of $30.7 billion for Bank of America Corporation, substantially all of which was TLAC compliant, $18.7 billion for Bank of America, N.A. and $15.0 billion of other debt. During 2017, we issued $53.3 billion of long-term debt consisting of $37.7 billion for Bank of America Corporation, substantially all of which was TLAC compliant, $8.2 billion for Bank of America, N.A. and $7.4 billion of other debt.

During 2018, we had total long-term debt maturities and redemptions in the aggregate of $53.3 billion consisting of $29.8 billion for Bank of America Corporation, $11.2 billion for Bank of America, N.A. and $12.3 billion of other debt. During 2017, we had total long-term debt maturities and redemptions in the aggregate of $48.8 billion consisting of $29.1 billion for Bank of America Corporation, $13.3 billion for Bank of America, N.A. and $6.4 billion of other debt.

During 2018, we redeemed trust preferred securities of 11 trusts with a carrying value of $3.1 billion and recorded a charge of $729 million in other income. We also collapsed two trusts, with no financial statement impact, that held fixed-rate junior subordinated notes with a carrying value of $741 million that were outstanding at December 31, 2018. At December 31, 2018, we had one remaining floating-rate junior subordinated note held in trust.

We use derivative transactions to manage the duration, interest rate and currency risks of our borrowings, considering the characteristics of the assets they are funding. For more information on our ALM activities, see Interest Rate Risk Management for the Banking Book on page 74.

We may also issue unsecured debt in the form of structured notes for client purposes, certain of which qualify as TLAC eligible debt. During 2018, we issued $6.9 billion of structured notes, which are debt obligations that pay investors returns linked to other debt or equity securities, indices, currencies or commodities. We typically hedge the returns we are obligated to pay on these liabilities with derivatives and/or investments in the underlying instruments, so that from a funding perspective, the cost is similar to our other unsecured long-term debt. We could be required to settle certain structured note obligations for cash or other securities prior to maturity under certain circumstances, which we consider for liquidity planning purposes. We believe, however, that a portion of such borrowings will remain outstanding beyond the earliest put or redemption date.

Substantially all of our senior and subordinated debt obligations contain no provisions that could trigger a requirement for an early repayment, require additional collateral support, result in changes to terms, accelerate maturity or create additional financial obligations upon an adverse change in our credit ratings, financial ratios, earnings, cash flows or stock price.

Contingency Planning

We maintain contingency funding plans that outline our potential responses to liquidity stress events at various levels of severity. These policies and plans are based on stress scenarios and include potential funding strategies and communication and notification procedures that we would implement in the event we experienced stressed liquidity conditions. We periodically review and test the contingency funding plans to validate efficacy and assess readiness.

Our U.S. bank subsidiaries can access contingency funding through the Federal Reserve Discount Window. Certain non-U.S. subsidiaries have access to central bank facilities in the jurisdictions in which they operate. While we do not rely on these sources in our liquidity modeling, we maintain the policies, procedures and governance processes that would enable us to access these sources if necessary.

Credit Ratings

Our borrowing costs and ability to raise funds are impacted by our credit ratings. In addition, credit ratings may be important to customers or counterparties when we compete in certain markets and when we seek to engage in certain transactions, including over-the-counter (OTC) derivatives. Thus, it is our objective to maintain high-quality credit ratings, and management maintains an active dialogue with the major rating agencies.

Credit ratings and outlooks are opinions expressed by rating agencies on our creditworthiness and that of our obligations

or securities, including long-term debt, short-term borrowings, preferred stock and other securities, including asset securitizations. Our credit ratings are subject to ongoing review by the rating agencies, and they consider a number of factors, including our own financial strength, performance, prospects and operations as well as factors not under our control. The rating agencies could make adjustments to our ratings at any time, and they provide no assurances that they will maintain our ratings at current levels.

Other factors that influence our credit ratings include changes to the rating agencies' methodologies for our industry or certain security types; the rating agencies' assessment of the general operating environment for financial services companies; our relative positions in the markets in which we compete; our various risk exposures and risk management policies and activities; pending litigation and other contingencies or potential tail risks; our reputation; our liquidity position, diversity of funding sources and funding costs; the current and expected level and volatility of our earnings; our capital position and capital management practices; our corporate governance; the sovereign credit ratings of the U.S. government; current or future regulatory and legislative initiatives; and the agencies' views on whether the U.S. government would provide meaningful support to the Corporation or its subsidiaries in a crisis.

On December 5, 2018, Moody's Investors Service (Moody's) placed the long-term and short-term ratings of the Corporation as well as the long-term ratings of its rated subsidiaries, including BANA, on review for upgrade. The agency cited the Corporation's strengthening profitability, continued adherence to a conservative risk profile, and stable capital ratios as drivers of the review. A rating review indicates that those ratings are under consideration for a change in the near term, which typically concludes within 90 days. Moody's concurrently affirmed the short-term ratings of the Corporation's rated subsidiaries, including BANA.

The ratings from Standard & Poor's Global Ratings (S&P) for the Corporation and its subsidiaries did not change during 2018. The last change to the ratings from S&P was a one-notch upgrade of the Corporation's long-term ratings in November 2017.

On June 21, 2018, Fitch Ratings (Fitch) upgraded the Corporation’s long-term senior debt rating to A+ from A as part of the agency’s latest review of 12 Global Trading & Investment Banks, citing our sustained and improved risk-adjusted earnings, lower risk appetite relative to peers, overall franchise strength and solid liquidity position. The Corporation’s short-term debt rating of F1 was affirmed. Additionally, Fitch upgraded the long- and short-term debt ratings of the Corporation’s rated U.S. subsidiaries, including BANA and MLPF&S, and upgraded the long-term debt ratings of our rated international subsidiaries, including MLI. The outlook at Fitch remains stable for all long-term debt ratings.

Table 20 presents the Corporation’s current long-term/short-term senior debt ratings and outlooks expressed by the rating agencies.

Table 20 Senior Debt Ratings

	Moody's Investors Service			Standard & Poor's Global Ratings			Fitch Ratings		
	Long-term	Short-term	Outlook	Long-term	Short-term	Outlook	Long-term	Short-term	Outlook
Bank of America Corporation	A3	P-2	Review for upgrade	A-	A-2	Stable	A+	F1	Stable
Bank of America, N.A.	Aa3	P-1	Review for upgrade (1)	A+	A-1	Stable	AA-	F1+	Stable
Merrill Lynch, Pierce, Fenner & Smith Incorporated	NR	NR	NR	A+	A-1	Stable	AA-	F1+	Stable
Merrill Lynch International	NR	NR	NR	A+	A-1	Stable	A+	F1	Stable

(1) Review for upgrade only applies to BANA's long-term rating.
NR = not rated

A reduction in certain of our credit ratings or the ratings of certain asset-backed securitizations may have a material adverse effect on our liquidity, potential loss of access to credit markets, the related cost of funds, our businesses and on certain trading revenues, particularly in those businesses where counterparty creditworthiness is critical. In addition, under the terms of certain OTC derivative contracts and other trading agreements, in the event of downgrades of our or our rated subsidiaries' credit ratings, the counterparties to those agreements may require us to provide additional collateral, or to terminate these contracts or agreements, which could cause us to sustain losses and/or adversely impact our liquidity. If the short-term credit ratings of our parent company, bank or broker-dealer subsidiaries were downgraded by one or more levels, the potential loss of access to short-term funding sources such as repo financing and the effect on our incremental cost of funds could be material.

While certain potential impacts are contractual and quantifiable, the full scope of the consequences of a credit rating downgrade to a financial institution is inherently uncertain, as it depends upon numerous dynamic, complex and inter-related factors and assumptions, including whether any downgrade of a company's long-term credit ratings precipitates downgrades to its short-term credit ratings, and assumptions about the potential behaviors of various customers, investors and counterparties. For more information on potential impacts of credit rating downgrades, see Liquidity Risk – Liquidity Stress Analysis on page 48.

For more information on additional collateral and termination payments that could be required in connection with certain OTC derivative contracts and other trading agreements as a result of such a credit rating downgrade, see *Note 3 – Derivatives* to the Consolidated Financial Statements and Item 1A. Risk Factors.

Common Stock Dividends

For a summary of our declared quarterly cash dividends on common stock during 2018 and through February 26, 2019, see *Note 13 – Shareholders' Equity* to the Consolidated Financial Statements.

Credit Risk Management

Credit risk is the risk of loss arising from the inability or failure of a borrower or counterparty to meet its obligations. Credit risk can also arise from operational failures that result in an erroneous advance, commitment or investment of funds. We define the credit exposure to a borrower or counterparty as the loss potential arising from all product classifications including loans and leases, deposit overdrafts, derivatives, assets held-for-sale and unfunded lending commitments which include loan commitments, letters of credit and financial guarantees. Derivative positions are recorded at fair value and assets held-for-sale are recorded at either fair value or the lower of cost or fair value. Certain loans and unfunded commitments are accounted for under the fair value option. Credit

risk for categories of assets carried at fair value is not accounted for as part of the allowance for credit losses but as part of the fair value adjustments recorded in earnings. For derivative positions, our credit risk is measured as the net cost in the event the counterparties with contracts in which we are in a gain position fail to perform under the terms of those contracts. We use the current fair value to represent credit exposure without giving consideration to future mark-to-market changes. The credit risk amounts take into consideration the effects of legally enforceable master netting agreements and cash collateral. Our consumer and commercial credit extension and review procedures encompass funded and unfunded credit exposures. For more information on derivatives and credit extension commitments, see *Note 3 – Derivatives* and *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements.

We manage credit risk based on the risk profile of the borrower or counterparty, repayment sources, the nature of underlying collateral, and other support given current events, conditions and expectations. We classify our portfolios as either consumer or commercial and monitor credit risk in each as discussed below.

We refine our underwriting and credit risk management practices as well as credit standards to meet the changing economic environment. To mitigate losses and enhance customer support in our consumer businesses, we have in place collection programs and loan modification and customer assistance infrastructures. We utilize a number of actions to mitigate losses in the commercial businesses including increasing the frequency and intensity of portfolio monitoring, hedging activity and our practice of transferring management of deteriorating commercial exposures to independent special asset officers as credits enter criticized categories.

For more information on our credit risk management activities, see Consumer Portfolio Credit Risk Management below, Commercial Portfolio Credit Risk Management on page 59, Non-U.S. Portfolio on page 65, Provision for Credit Losses on page 67, Allowance for Credit Losses on page 67, and *Note 5 – Outstanding Loans and Leases* and *Note 6 – Allowance for Credit Losses* to the Consolidated Financial Statements.

Consumer Portfolio Credit Risk Management

Credit risk management for the consumer portfolio begins with initial underwriting and continues throughout a borrower’s credit cycle. Statistical techniques in conjunction with experiential judgment are used in all aspects of portfolio management including underwriting, product pricing, risk appetite, setting credit limits, and establishing operating processes and metrics to quantify and balance risks and returns. Statistical models are built using detailed behavioral information from external sources such as credit bureaus and/or internal historical experience and are a component of our consumer credit risk management process. These models are used in part to assist in making both new and ongoing credit decisions, as well as portfolio management strategies, including authorizations and line management, collection practices and strategies, and determination of the allowance for loan and lease losses and allocated capital for credit risk.

Consumer Credit Portfolio

Improvement in home prices continued during 2018 resulting in improved credit quality and lower credit losses in the home equity portfolio, partially offset by seasoning and loan growth in the U.S. credit card portfolio compared to 2017.

Improved credit quality, continued loan balance runoff and sales primarily in the non-core consumer real estate portfolio, partially offset by seasoning within the U.S. credit card portfolio, drove a $581 million decrease in the consumer allowance for loan and lease losses in 2018 to $4.8 billion at December 31, 2018. For additional information, see Allowance for Credit Losses on page 67.

For more information on our accounting policies regarding delinquencies, nonperforming status, charge-offs, troubled debt restructurings (TDRs) for the consumer portfolio and PCI loans, see *Note 1 – Summary of Significant Accounting Principles* and

Note 5 – Outstanding Loans and Leases to the Consolidated Financial Statements.

Table 21 presents our outstanding consumer loans and leases, consumer nonperforming loans and accruing consumer loans past due 90 days or more. Nonperforming loans do not include past due consumer credit card loans, other unsecured loans and in general, consumer loans not secured by real estate (bankruptcy loans are included) as these loans are typically charged off no later than the end of the month in which the loan becomes 180 days past due. Real estate-secured past due consumer loans that are insured by the FHA or individually insured under long-term standby agreements with Fannie Mae and Freddie Mac (collectively, the fully-insured loan portfolio) are reported as accruing as opposed to nonperforming since the principal repayment is insured. Fully-insured loans included in accruing past due 90 days or more are primarily from our repurchases of delinquent FHA loans pursuant to our servicing agreements with the Government National Mortgage Association (GNMA). Additionally, nonperforming loans and accruing balances past due 90 days or more do not include the PCI loan portfolio or loans accounted for under the fair value option even though the customer may be contractually past due.

Table 21 Consumer Credit Quality

	Outstandings		Nonperforming		Accruing Past Due 90 Days or More	
	December 31					
(Dollars in millions)	**2018**	2017	**2018**	2017	**2018**	2017
Residential mortgage [(1)]	**$208,557**	$203,811	**$1,893**	$2,476	**$1,884**	$3,230
Home equity	**48,286**	57,744	**1,893**	2,644	**—**	—
U.S. credit card	**98,338**	96,285	**n/a**	n/a	**994**	900
Direct/Indirect consumer [(2)]	**91,166**	96,342	**56**	46	**38**	40
Other consumer [(3)]	**202**	166	**—**	—	**—**	—
Consumer loans excluding loans accounted for under the fair value option	**$446,549**	$454,348	**$3,842**	$5,166	**$2,916**	$4,170
Loans accounted for under the fair value option [(4)]	**682**	928				
Total consumer loans and leases	**$447,231**	$455,276				
Percentage of outstanding consumer loans and leases [(5)]	**n/a**	n/a	**0.86 %**	1.14 %	**0.65 %**	0.92 %
Percentage of outstanding consumer loans and leases, excluding PCI and fully-insured loan portfolios [(5)]	**n/a**	n/a	**0.91**	1.23	**0.24**	0.22

(1) Residential mortgage loans accruing past due 90 days or more are fully-insured loans. At December 31, 2018 and 2017, residential mortgage includes $1.4 billion and $2.2 billion of loans on which interest had been curtailed by the FHA, and therefore were no longer accruing interest, although principal was still insured, and $498 million and $1.0 billion of loans on which interest was still accruing.

(2) Outstandings include auto and specialty lending loans and leases of $50.1 billion and $52.4 billion, unsecured consumer lending loans of $383 million and $469 million, U.S. securities-based lending loans of $37.0 billion and $39.8 billion, non-U.S. consumer loans of $2.9 billion and $3.0 billion and other consumer loans of $746 million and $684 million at December 31, 2018 and 2017.

(3) Substantially all of other consumer at December 31, 2018 and 2017 is consumer overdrafts.

(4) Consumer loans accounted for under the fair value option include residential mortgage loans of $336 million and $567 million and home equity loans of $346 million and $361 million at December 31, 2018 and 2017. For more information on the fair value option, see *Note 21 – Fair Value Option* to the Consolidated Financial Statements.

(5) Excludes consumer loans accounted for under the fair value option. At December 31, 2018 and 2017, $12 million and $26 million of loans accounted for under the fair value option were past due 90 days or more and not accruing interest.

n/a = not applicable

Table 22 presents net charge-offs and related ratios for consumer loans and leases.

Table 22 Consumer Net Charge-offs and Related Ratios

	Net Charge-offs [1]		Net Charge-off Ratios [1, 2]	
(Dollars in millions)	**2018**	2017	**2018**	2017
Residential mortgage	**$ 28**	$ (100)	**0.01%**	(0.05)%
Home equity	**(2)**	213	**—**	0.34
U.S. credit card	**2,837**	2,513	**3.00**	2.76
Non-U.S. credit card [3]	**—**	75	**—**	1.91
Direct/Indirect consumer	**195**	214	**0.21**	0.22
Other consumer	**182**	163	**n/m**	n/m
Total	**$ 3,240**	$ 3,078	**0.72**	0.68

(1) Net charge-offs exclude write-offs in the PCI loan portfolio. For more information, see Consumer Portfolio Credit Risk Management – Purchased Credit-impaired Loan Portfolio on page 57.

(2) Net charge-off ratios are calculated as net charge-offs divided by average outstanding loans and leases excluding loans accounted for under the fair value option.

(3) Represents net charge-offs related to the non-U.S. credit card loan portfolio, which was sold during the second quarter of 2017.

n/m = not meaningful

Net charge-offs, as shown in Tables 22 and 23, exclude write-offs in the PCI loan portfolio of $154 million and $131 million in residential mortgage and $119 million and $76 million in home equity for 2018 and 2017. Net charge-off ratios including the PCI write-offs were 0.09 percent and 0.02 percent for residential mortgage and 0.22 percent and 0.47 percent for home equity in 2018 and 2017.

Table 23 presents outstandings, nonperforming balances, net charge-offs, allowance for loan and lease losses and provision for loan and lease losses for the core and non-core portfolios within the consumer real estate portfolio. We categorize consumer real estate loans as core and non-core based on loan and customer characteristics such as origination date, product type, loan-to-value (LTV), Fair Isaac Corporation (FICO) score and delinquency status consistent with our current consumer and mortgage servicing strategy. Generally, loans that were originated after January 1,

2010, qualified under GSE underwriting guidelines, or otherwise met our underwriting guidelines in place in 2015 are characterized as core loans. All other loans are generally characterized as non-core loans and represent runoff portfolios. Core loans as reported in Table 23 include loans held in the *Consumer Banking* and *GWIM* segments, as well as loans held for ALM activities in *All Other*.

As shown in Table 23, outstanding core consumer real estate loans increased $12.8 billion during 2018 driven by an increase of $17.1 billion in residential mortgage, partially offset by a $4.2 billion decrease in home equity. During 2018, we sold $11.6 billion of consumer real estate loans compared to $4.0 billion in 2017. In addition to recurring loan sales, the 2018 amount includes sales of loans, primarily non-core, with a carrying value of $9.6 billion and related gains of $731 million recorded in other income in the Consolidated Statement of Income.

Table 23 Consumer Real Estate Portfolio [(1)]

	Outstandings		Nonperforming		Net Charge-offs [(2)]	
	December 31					
(Dollars in millions)	**2018**	2017	**2018**	2017	**2018**	2017
Core portfolio						
Residential mortgage	**$ 193,695**	$ 176,618	**$ 1,010**	$ 1,087	**$ 11**	$ (45)
Home equity	**40,010**	44,245	**955**	1,079	**78**	100
Total core portfolio	**233,705**	220,863	**1,965**	2,166	**89**	55
Non-core portfolio						
Residential mortgage	**14,862**	27,193	**883**	1,389	**17**	(55)
Home equity	**8,276**	13,499	**938**	1,565	**(80)**	113
Total non-core portfolio	**23,138**	40,692	**1,821**	2,954	**(63)**	58
Consumer real estate portfolio						
Residential mortgage	**208,557**	203,811	**1,893**	2,476	**28**	(100)
Home equity	**48,286**	57,744	**1,893**	2,644	**(2)**	213
Total consumer real estate portfolio	**$ 256,843**	$ 261,555	**$ 3,786**	$ 5,120	**$ 26**	$ 113

			Allowance for Loan and Lease Losses		Provision for Loan and Lease Losses	
			December 31			

	2018	2017	**2018**	2017
Core portfolio				
Residential mortgage	**$ 214**	$ 218	**$ 7**	$ (79)
Home equity	**228**	367	**(60)**	(91)
Total core portfolio	**442**	585	**(53)**	(170)
Non-core portfolio				
Residential mortgage	**208**	483	**(104)**	(201)
Home equity	**278**	652	**(335)**	(339)
Total non-core portfolio	**486**	1,135	**(439)**	(540)
Consumer real estate portfolio				
Residential mortgage	**422**	701	**(97)**	(280)
Home equity	**506**	1,019	**(395)**	(430)
Total consumer real estate portfolio	**$ 928**	$ 1,720	**$ (492)**	$ (710)

(1) Outstandings and nonperforming loans exclude loans accounted for under the fair value option. Consumer loans accounted for under the fair value option included residential mortgage loans of $336 million and $567 million and home equity loans of $346 million and $361 million at December 31, 2018 and 2017. For additional information, see *Note 21 – Fair Value Option* to the Consolidated Financial Statements.

(2) Net charge-offs exclude write-offs in the PCI loan portfolio. For more information, see Consumer Portfolio Credit Risk Management – Purchased Credit-impaired Loan Portfolio on page 57.

We believe that the presentation of information adjusted to exclude the impact of the PCI loan portfolio, the fully-insured loan portfolio and loans accounted for under the fair value option is more representative of the ongoing operations and credit quality of the business. As a result, in the following tables and discussions of the residential mortgage and home equity portfolios, we exclude loans accounted for under the fair value option and provide information that excludes the impact of the PCI loan portfolio and the fully-insured loan portfolio in certain credit quality statistics. We separately disclose information on the PCI loan portfolio on page 57.

Residential Mortgage

The residential mortgage portfolio made up the largest percentage of our consumer loan portfolio at 47 percent of consumer loans and leases at December 31, 2018. Approximately 44 percent of the residential mortgage portfolio was in *Consumer Banking* and 37 percent was in *GWIM.* The remaining portion was in *All Other* and was comprised of originated loans, purchased loans used in our overall ALM activities, delinquent FHA loans repurchased pursuant to our servicing agreements with GNMA as well as loans repurchased related to our representations and warranties.

Outstanding balances in the residential mortgage portfolio increased $4.7 billion in 2018 as retention of new originations was partially offset by loan sales of $8.9 billion and runoff.

At December 31, 2018 and 2017, the residential mortgage portfolio included $20.1 billion and $23.7 billion of outstanding fully-insured loans, of which $14.0 billion and $17.4 billion had FHA insurance with the remainder protected by long-term standby agreements. At December 31, 2018 and 2017, $3.5 billion and $5.2 billion of the FHA-insured loan population were repurchases of delinquent FHA loans pursuant to our servicing agreements with GNMA.

Table 24 presents certain residential mortgage key credit statistics on both a reported basis and excluding the PCI loan portfolio and the fully-insured loan portfolio. Additionally, in the "Reported Basis" columns in the following table, accruing balances past due and nonperforming loans do not include the PCI loan portfolio, in accordance with our accounting policies, even though the customer may be contractually past due. As such, the following discussion presents the residential mortgage portfolio excluding the PCI loan portfolio and the fully-insured loan portfolio.

Table 24 Residential Mortgage – Key Credit Statistics

	Reported Basis (1)		Excluding Purchased Credit-impaired and Fully-insured Loans (1)	
	December 31			
(Dollars in millions)	**2018**	2017	**2018**	2017
Outstandings	**$208,557**	$203,811	**$184,627**	$172,069
Accruing past due 30 days or more	**3,945**	5,987	**1,155**	1,521
Accruing past due 90 days or more	**1,884**	3,230	**—**	—
Nonperforming loans	**1,893**	2,476	**1,893**	2,476
Percent of portfolio				
Refreshed LTV greater than 90 but less than or equal to 100	**2 %**	3 %	**1 %**	2 %
Refreshed LTV greater than 100	**1**	2	**1**	1
Refreshed FICO below 620	**4**	6	**2**	3
2006 and 2007 vintages (2)	**6**	10	**5**	8
	2018	2017	**2018**	2017
Net charge-off ratio (3)	**0.01 %**	(0.05)%	**0.02 %**	(0.06)%

(1) Outstandings, accruing past due, nonperforming loans and percentages of portfolio exclude loans accounted for under the fair value option.

(2) These vintages of loans accounted for $536 million, or 28 percent, and $825 million, or 33 percent, of nonperforming residential mortgage loans at December 31, 2018 and 2017.

(3) Net charge-off ratios are calculated as net charge-offs divided by average outstanding loans excluding loans accounted for under the fair value option.

Nonperforming residential mortgage loans decreased $583 million in 2018 primarily driven by sales. Of the nonperforming residential mortgage loans at December 31, 2018, $716 million, or 38 percent, were current on contractual payments. Loans accruing past due 30 days or more decreased $366 million due to continued improvement in credit quality as well as loan sales in the non-core portfolio.

Net charge-offs increased $128 million to $28 million in 2018 compared to $100 million of net recoveries in 2017 primarily due to net recoveries related to loan sales in 2017.

Loans with a refreshed LTV greater than 100 percent represented one percent of the residential mortgage loan portfolio at both December 31, 2018 and 2017. Of the loans with a refreshed LTV greater than 100 percent, 99 percent and 98 percent were performing at December 31, 2018 and 2017. Loans with a refreshed LTV greater than 100 percent reflect loans where the outstanding carrying value of the loan is greater than the most recent valuation of the property securing the loan.

Of the $184.6 billion in total residential mortgage loans outstanding at December 31, 2018, as shown in Table 24, 30 percent were originated as interest-only loans. The outstanding balance of interest-only residential mortgage loans that have

entered the amortization period was $8.6 billion, or 16 percent, at December 31, 2018. Residential mortgage loans that have entered the amortization period generally have experienced a higher rate of early stage delinquencies and nonperforming status compared to the residential mortgage portfolio as a whole. At December 31, 2018, $177 million, or two percent, of outstanding interest-only residential mortgages that had entered the amortization period were accruing past due 30 days or more compared to $1.2 billion, or one percent, for the entire residential mortgage portfolio. In addition, at December 31, 2018, $365 million, or four percent, of outstanding interest-only residential mortgage loans that had entered the amortization period were nonperforming, of which $128 million were contractually current, compared to $1.9 billion, or one percent, for the entire residential mortgage portfolio. Loans that have yet to enter the amortization period in our interest-only residential mortgage portfolio are primarily well-collateralized loans to our wealth management clients and have an interest-only period of three to ten years. Approximately 90 percent of these loans that have yet to enter the amortization period will not be required to make a fully-amortizing payment until 2022 or later.

Table 25 presents outstandings, nonperforming loans and net charge-offs by certain state concentrations for the residential mortgage portfolio. The Los Angeles-Long Beach-Santa Ana Metropolitan Statistical Area (MSA) within California represented 16 percent of outstandings at both December 31, 2018 and 2017. In the New York area, the New York-Northern New Jersey-Long Island MSA made up 13 percent of outstandings at both December 31, 2018 and 2017.

Table 25 Residential Mortgage State Concentrations

	Outstandings (1)		Nonperforming (1)		Net Charge-offs (2)	
	December 31					
(Dollars in millions)	**2018**	2017	**2018**	2017	**2018**	2017
California	**$74,463**	$68,455	**$314**	$433	**$(22)**	$(103)
New York (3)	**19,085**	17,239	**222**	227	**10**	(2)
Florida (3)	**11,296**	10,880	**221**	280	**(6)**	(13)
Texas	**7,747**	7,237	**102**	126	**4**	1
New Jersey (3)	**6,959**	6,099	**98**	130	**8**	—
Other	**65,077**	62,159	**936**	1,280	**34**	17
Residential mortgage loans (4)	**$184,627**	$172,069	**$1,893**	$2,476	**$28**	$(100)
Fully-insured loan portfolio	**20,130**	23,741				
Purchased credit-impaired residential mortgage loan portfolio (5)	**3,800**	8,001				
Total residential mortgage loan portfolio	**$208,557**	$203,811				

(1) Outstandings and nonperforming loans exclude loans accounted for under the fair value option.

(2) Net charge-offs exclude $154 million and $131 million of write-offs in the residential mortgage PCI loan portfolio in 2018 and 2017. For more information on PCI write-offs, see Consumer Portfolio Credit Risk Management – Purchased Credit-impaired Loan Portfolio on page57.

(3) In these states, foreclosure requires a court order following a legal proceeding (judicial states).

(4) Amounts exclude the PCI residential mortgage and fully-insured loan portfolios.

(5) At December 31, 2018 and 2017, 49 percent and 47 percent of PCI residential mortgage loans were in California. There were no other significant single state concentrations.

Home Equity

At December 31, 2018, the home equity portfolio made up 11 percent of the consumer portfolio and was comprised of home equity lines of credit (HELOCs), home equity loans and reverse mortgages.

At December 31, 2018, our HELOC portfolio had an outstanding balance of $44.3 billion, or 92 percent of the total home equity portfolio, compared to $51.2 billion, or 89 percent, at December 31, 2017. HELOCs generally have an initial draw period of 10 years, and after the initial draw period ends, the loans generally convert to 15-year amortizing loans.

At December 31, 2018, our home equity loan portfolio had an outstanding balance of $1.8 billion, or four percent of the total home equity portfolio, compared to $4.4 billion, or seven percent, at December 31, 2017. Home equity loans are almost all fixed-rate loans with amortizing payment terms of 10 to 30 years, and of the $1.8 billion at December 31, 2018, 68 percent have 25- to 30-year terms. At December 31, 2018, our reverse mortgage portfolio had an outstanding balance of $2.2 billion, or four percent of the total home equity portfolio, compared to $2.1 billion, or four percent, at December 31, 2017. We no longer originate reverse mortgages.

At December 31, 2018, 75 percent of the home equity portfolio was in *Consumer Banking*, 17 percent was in *All Other* and the remainder of the portfolio was primarily in *GWIM*. Outstanding balances in the home equity portfolio decreased $9.5 billion in 2018 primarily due to paydowns and loan sales of $2.7 billion outpacing new originations and draws on existing lines. Of the total home equity portfolio at December 31, 2018 and 2017, $17.3 billion and $18.7 billion, or 36 percent and 32 percent, were in first-lien positions. At December 31, 2018, outstanding balances in the home equity portfolio that were in a second-lien or more junior-lien position and where we also held the first-lien loan totaled $7.9 billion, or 17 percent of our total home equity portfolio excluding the PCI loan portfolio.

Unused HELOCs totaled $43.1 billion and $44.2 billion at December 31, 2018 and 2017. The decrease was primarily due to accounts reaching the end of their draw period, which automatically eliminates open line exposure, and customers choosing to close accounts. Both of these more than offset the impact of new production. The HELOC utilization rate was 51 percent and 54 percent at December 31, 2018 and 2017.

Table 26 presents certain home equity portfolio key credit statistics on both a reported basis and excluding the PCI loan portfolio. Additionally, in the “Reported Basis” columns in the following table, accruing balances past due 30 days or more and nonperforming loans do not include the PCI loan portfolio, in accordance with our accounting policies, even though the customer may be contractually past due. As such, the following discussion presents the home equity portfolio excluding the PCI loan portfolio.

Table 26 Home Equity – Key Credit Statistics

	Reported Basis [1]		Excluding Purchased Credit-impaired Loans [1]	
	December 31			
(Dollars in millions)	**2018**	2017	**2018**	2017
Outstandings	**$48,286**	$57,744	**$47,441**	$55,028
Accruing past due 30 days or more [2]	**363**	502	**363**	502
Nonperforming loans [2]	**1,893**	2,644	**1,893**	2,644
Percent of portfolio				
Refreshed CLTV greater than 90 but less than or equal to 100	**2 %**	3 %	**2 %**	3 %
Refreshed CLTV greater than 100	**3**	5	**3**	4
Refreshed FICO below 620	**5**	6	**5**	6
2006 and 2007 vintages [3]	**22**	29	**21**	27
	2018	2017	**2018**	2017
Net charge-off ratio [4]	**— %**	0.34 %	**— %**	0.36 %

(1) Outstandings, accruing past due, nonperforming loans and percentages of the portfolio exclude loans accounted for under the fair value option.

(2) Accruing past due 30 days or more include $48 million and $67 million and nonperforming loans include $218 million and $344 million of loans where we serviced the underlying first lien at December 31, 2018 and 2017.

(3) These vintages of loans have higher refreshed combined loan-to-value (CLTV) ratios and accounted for 49 percent and 52 percent of nonperforming home equity loans at December 31, 2018 and 2017, and $11 million and $193 million of net charge-offs in 2018 and 2017.

(4) Net charge-off ratios are calculated as net charge-offs divided by average outstanding loans excluding loans accounted for under the fair value option.

Nonperforming outstanding balances in the home equity portfolio decreased $751 million in 2018 as outflows, including sales, outpaced new inflows. Of the nonperforming home equity loans at December 31, 2018, $1.1 billion, or 59 percent, were current on contractual payments. Nonperforming loans that are contractually current primarily consist of collateral-dependent TDRs, including those that have been discharged in Chapter 7 bankruptcy, junior-lien loans where the underlying first lien is 90 days or more past due, as well as loans that have not yet demonstrated a sustained period of payment performance following a TDR. In addition, $463 million, or 24 percent, of nonperforming home equity loans were 180 days or more past due and had been written down to the estimated fair value of the collateral, less costs to sell. Accruing loans that were 30 days or more past due decreased $139 million in 2018.

In some cases, the junior-lien home equity outstanding balance that we hold is performing, but the underlying first lien is not. For outstanding balances in the home equity portfolio on which we service the first-lien loan, we are able to track whether the first-lien loan is in default. For loans where the first lien is serviced by a third party, we utilize credit bureau data to estimate the delinquency status of the first lien. At December 31, 2018, we estimate that $610 million of current and $83 million of 30 to 89 days past due junior-lien loans were behind a delinquent first-lien loan. We service the first-lien loans on $114 million of these combined amounts, with the remaining $579 million serviced by third parties. Of the $693 million of current to 89 days past due junior-lien loans, based on available credit bureau data and our own internal servicing data, we estimate that approximately $221 million had first-lien loans that were 90 days or more past due.

Net charge-offs decreased $215 million to a net recovery of $2 million in 2018 compared to net charge-offs of $213 million in 2017 driven by favorable portfolio trends due in part to improvement in home prices and the U.S. economy.

Outstanding balances with a refreshed CLTV greater than 100 percent comprised three percent and four percent of the home equity portfolio at December 31, 2018 and 2017. Outstanding balances with a refreshed CLTV greater than 100 percent reflect loans where our loan and available line of credit combined with any outstanding senior liens against the property are equal to or greater than the most recent valuation of the property securing the loan. Depending on the value of the property, there may be collateral in excess of the first lien that is available to reduce the

severity of loss on the second lien. Of those outstanding balances with a refreshed CLTV greater than 100 percent, 96 percent of the customers were current on their home equity loan and 91 percent of second-lien loans with a refreshed CLTV greater than 100 percent were current on both their second-lien and underlying first-lien loans at December 31, 2018.

Of the $47.4 billion in total home equity portfolio outstandings at December 31, 2018, as shown in Table 26, 20 percent require interest-only payments. The outstanding balance of HELOCs that have reached the end of their draw period and have entered the amortization period was $15.8 billion at December 31, 2018. The HELOCs that have entered the amortization period have experienced a higher percentage of early stage delinquencies and nonperforming status when compared to the HELOC portfolio as a whole. At December 31, 2018, $267 million, or two percent, of outstanding HELOCs that had entered the amortization period were accruing past due 30 days or more. In addition, at December 31, 2018, $1.7 billion, or 11 percent, of outstanding HELOCs that had entered the amortization period were nonperforming. Loans that have yet to enter the amortization period in our interest-only portfolio are primarily post-2008 vintages and generally have better credit quality than the previous vintages that had entered the amortization period. We communicate to contractually current customers more than a year prior to the end of their draw period to inform them of the potential change to the payment structure before entering the amortization period, and provide payment options to customers prior to the end of the draw period.

Although we do not actively track how many of our home equity customers pay only the minimum amount due on their home equity loans and lines, we can infer some of this information through a review of our HELOC portfolio that we service and that is still in its revolving period. During 2018, 14 percent of these customers with an outstanding balance did not pay any principal on their HELOCs.

Table 27 presents outstandings, nonperforming balances and net charge-offs by certain state concentrations for the home equity portfolio. In the New York area, the New York-Northern New Jersey-Long Island MSA made up 13 percent of the outstanding home equity portfolio at both December 31, 2018 and 2017. Loans within this MSA contributed $35 million and $58 million of net charge-offs in 2018 and 2017 within the home equity portfolio. The Los Angeles-Long Beach-Santa Ana MSA within California made up 11 percent of the outstanding home equity portfolio at both December 31, 2018 and 2017. Loans within this MSA contributed net recoveries of $23 million and $20 million within the home equity portfolio in 2018 and 2017.

Table 27 Home Equity State Concentrations

	Outstandings (1)		Nonperforming (1)		Net Charge-offs (2)	
	December 31					
(Dollars in millions)	**2018**	2017	**2018**	2017	**2018**	2017
California	**$13,228**	$15,145	**$536**	$766	**$(54)**	$(37)
Florida (3)	**5,363**	6,308	**315**	411	**1**	38
New Jersey (3)	**3,833**	4,546	**150**	191	**25**	44
New York (3)	**3,549**	4,195	**194**	252	**23**	35
Massachusetts	**2,376**	2,751	**65**	92	**5**	9
Other	**19,092**	22,083	**633**	932	**(2)**	124
Home equity loans (4)	**$47,441**	$55,028	**$1,893**	$2,644	**$(2)**	$213
Purchased credit-impaired home equity portfolio (5)	**845**	2,716				
Total home equity loan portfolio	**$48,286**	$57,744				

(1) Outstandings and nonperforming loans exclude loans accounted for under the fair value option.

(2) Net charge-offs exclude $119 million and $76 million of write-offs in the home equity PCI loan portfolio in 2018 and 2017. For more information on PCI write-offs, see Consumer Portfolio Credit Risk Management – Purchased Credit-impaired Loan Portfolio.

(3) In these states, foreclosure requires a court order following a legal proceeding (judicial states).

(4) Amount excludes the PCI home equity portfolio.

(5) At December 31, 2018 and 2017, 34 percent and 28 percent of PCI home equity loans were in California. There were no other significant single state concentrations.

Purchased Credit-impaired Loan Portfolio

Loans acquired with evidence of credit quality deterioration since origination and for which it is probable at purchase that we will be unable to collect all contractually required payments are accounted for under the accounting standards for PCI loans.

Table 28 presents the unpaid principal balance, carrying value, related valuation allowance and the net carrying value as a percentage of the unpaid principal balance for the PCI loan portfolio.

Table 28 Purchased Credit-impaired Loan Portfolio

(Dollars in millions)	Unpaid Principal Balance	Gross Carrying Value	Related Valuation Allowance	Carrying Value Net of Valuation Allowance	Percent of Unpaid Principal Balance
	December 31, 2018				
Residential mortgage (1)	**$3,872**	**$3,800**	**$ 30**	**$ 3,770**	**97.37 %**
Home equity	**896**	**845**	**61**	**784**	**87.50**
Total purchased credit-impaired loan portfolio	**$4,768**	**$4,645**	**$ 91**	**$ 4,554**	**95.51**

	December 31, 2017					
Residential mortgage (1)	$ 8,117	$ 8,001	$ 117	$ 7,884	97.13	%
Home equity	2,787	2,716	172	2,544	91.28	
Total purchased credit-impaired loan portfolio	$ 10,904	$ 10,717	$ 289	$ 10,428	95.63	

(1) At December 31, 2018 and 2017, pay option loans had an unpaid principal balance of $757 million and $1.4 billion and a carrying value of $744 million and $1.4 billion. This includes $645 million and $1.2 billion of loans that were credit-impaired upon acquisition and $67 million and $141 million of loans that were 90 days or more past due. The total unpaid principal balance of pay option loans with accumulated negative amortization was $73 million and $160 million, including $4 million and $9 million of negative amortization at December 31, 2018 and 2017.

The total PCI unpaid principal balance decreased $6.1 billion, or 56 percent, in 2018 primarily driven by loan sales with a carrying value of $4.4 billion compared to sales of $803 million in 2017.

Of the unpaid principal balance of $4.8 billion at December 31, 2018, $4.3 billion, or 90 percent, was current based on the contractual terms, $208 million, or four percent, was in early stage delinquency and $205 million was 180 days or more past due, including $172 million of first-lien mortgages and $33 million of home equity loans.

The PCI residential mortgage loan and home equity portfolios represented 82 percent and 18 percent of the total PCI loan portfolio at December 31, 2018. Those loans to borrowers with a refreshed FICO score below 620 represented 19 percent and 21 percent of the PCI residential mortgage loan and home equity portfolios at December 31, 2018. Residential mortgage and home equity loans with a refreshed LTV or CLTV greater than 90 percent, after consideration of purchase accounting adjustments and the related valuation allowance, represented 10 percent and 28 percent of their respective PCI loan portfolios and 11 percent and

32 percent based on the unpaid principal balance at December 31, 2018.

U.S. Credit Card

At December 31, 2018, 97 percent of the U.S. credit card portfolio was managed in *Consumer Banking* with the remainder in *GWIM*. Outstandings in the U.S. credit card portfolio increased $2.1 billion in 2018 to $98.3 billion due to higher retail volume partially offset by payments as well as the sale of a small portfolio. In 2018, net charge-offs increased $324 million to $2.8 billion, and U.S. credit card loans 30 days or more past due and still accruing interest increased $142 million and loans 90 days or more past due and still accruing interest increased $94 million, each driven by portfolio seasoning and loan growth.

Unused lines of credit for U.S. credit card totaled $334.8 billion and $326.3 billion at December 31, 2018 and 2017. The increase was driven by account growth and lines of credit increases.

Table 29 presents certain state concentrations for the U.S. credit card portfolio.

Table 29 **U.S. Credit Card State Concentrations**

	Outstandings		Accruing Past Due 90 Days or More		Net Charge-offs	
	December 31					
(Dollars in millions)	**2018**	2017	**2018**	2017	**2018**	2017
California	**$ 16,062**	$ 15,254	**$ 163**	$ 136	**$ 479**	$ 412
Florida	**8,840**	8,359	**119**	94	**332**	259
Texas	**7,730**	7,451	**84**	76	**224**	194
New York	**6,066**	5,977	**81**	91	**268**	218
Washington	**4,558**	4,350	**24**	20	**63**	56
Other	**55,082**	54,894	**523**	483	**1,471**	1,374
Total U.S. credit card portfolio	**$ 98,338**	$ 96,285	**$ 994**	$ 900	**$ 2,837**	$ 2,513

Direct/Indirect Consumer

At December 31, 2018, 55 percent of the direct/indirect portfolio was included in *Consumer Banking* (consumer auto and specialty lending – automotive, marine, aircraft, recreational vehicle loans and consumer personal loans) and 45 percent was included in *GWIM* (principally securities-based lending loans).

Outstandings in the direct/indirect portfolio decreased $5.2 billion in 2018 to $91.2 billion primarily due to declines in securities-based lending due to higher paydowns, and in our auto portfolio as paydowns outpaced originations. Net charge-offs decreased $19 million to $195 million in 2018 due largely to clarifying regulatory guidance related to bankruptcy and repossession issued during 2017.

Table 30 presents certain state concentrations for the direct/indirect consumer loan portfolio.

Table 30 **Direct/Indirect State Concentrations**

	Outstandings		Accruing Past Due 90 Days or More		Net Charge-offs	
	December 31					
(Dollars in millions)	**2018**	2017	**2018**	2017	**2018**	2017
California	**$ 11,734**	$ 12,897	**$ 4**	$ 3	**$ 21**	$ 21
Florida	**10,240**	11,184	**4**	5	**36**	43
Texas	**9,876**	10,676	**6**	5	**30**	38
New York	**6,296**	6,557	**2**	2	**9**	7
New Jersey	**3,308**	3,449	**1**	1	**2**	6
Other	**49,712**	51,579	**21**	24	**97**	99
Total direct/indirect loan portfolio	**$ 91,166**	$ 96,342	**$ 38**	$ 40	**$ 195**	$ 214

Nonperforming Consumer Loans, Leases and Foreclosed Properties Activity

Table 31 presents nonperforming consumer loans, leases and foreclosed properties activity during 2018 and 2017. During 2018, nonperforming consumer loans declined $1.3 billion to $3.8 billion primarily driven by loan sales of $969 million.

At December 31, 2018, $1.1 billion, or 29 percent, of nonperforming loans were 180 days or more past due and had been written down to their estimated property value less costs to sell. In addition, at December 31, 2018, $1.9 billion, or 49 percent, of nonperforming consumer loans were modified and are now current after successful trial periods, or are current loans classified as nonperforming loans in accordance with applicable policies.

Foreclosed properties increased $8 million in 2018 to $244 million as additions outpaced liquidations. PCI loans are excluded from nonperforming loans as these loans were written down to fair value at the acquisition date; however, once we acquire the underlying real estate upon foreclosure of the delinquent PCI loan,

it is included in foreclosed properties. Certain delinquent government-guaranteed loans (principally FHA-insured loans) are excluded from our nonperforming loans and foreclosed properties activity as we expect we will be reimbursed once the property is conveyed to the guarantor for principal and, up to certain limits, costs incurred during the foreclosure process and interest accrued during the holding period.

We classify junior-lien home equity loans as nonperforming when the first-lien loan becomes 90 days past due even if the junior-lien loan is performing. At December 31, 2018 and 2017, $221 million and $330 million of such junior-lien home equity loans were included in nonperforming loans and leases.

Nonperforming loans also include certain loans that have been modified in TDRs where economic concessions have been granted to borrowers experiencing financial difficulties. Nonperforming TDRs, excluding those modified loans in the PCI loan portfolio, are included in Table 31.

Table 31 Nonperforming Consumer Loans, Leases and Foreclosed Properties Activity

(Dollars in millions)	2018	2017
Nonperforming loans and leases, January 1	**$5,166**	$6,004
Additions	**2,440**	3,254
Reductions:		
Paydowns and payoffs	**(958)**	(1,052)
Sales	**(969)**	(511)
Returns to performing status [1]	**(1,283)**	(1,438)
Charge-offs	**(401)**	(676)
Transfers to foreclosed properties	**(151)**	(217)
Transfers to loans held-for-sale	**(2)**	(198)
Total net reductions to nonperforming loans and leases	**(1,324)**	(838)
Total nonperforming loans and leases, December 31	**3,842**	5,166
Foreclosed properties, December 31 [2]	**244**	236
Nonperforming consumer loans, leases and foreclosed properties, December 31	**$4,086**	$5,402
Nonperforming consumer loans and leases as a percentage of outstanding consumer loans and leases [3]	**0.86 %**	1.14 %
Nonperforming consumer loans, leases and foreclosed properties as a percentage of outstanding consumer loans, leases and foreclosed properties [3]	**0.92**	1.19

(1) Consumer loans may be returned to performing status when all principal and interest is current and full repayment of the remaining contractual principal and interest is expected, or when the loan otherwise becomes well-secured and is in the process of collection.

(2) Foreclosed property balances do not include properties insured by certain government-guaranteed loans, principally FHA-insured, of $488 million and $801 million at December 31, 2018 and 2017.

(3) Outstanding consumer loans and leases exclude loans accounted for under the fair value option.

Table 32 presents TDRs for the consumer real estate portfolio. Performing TDR balances are excluded from nonperforming loans and leases in Table 31.

Table 32 Consumer Real Estate Troubled Debt Restructurings

	December 31, 2018			December 31, 2017		
(Dollars in millions)	**Nonperforming**	**Performing**	**Total**	Nonperforming	Performing	Total
Residential mortgage [1, 2]	**$1,209**	**$ 4,988**	**$6,197**	$1,535	$ 8,163	$9,698
Home equity [3]	**1,107**	**1,252**	**2,359**	1,457	1,399	2,856
Total consumer real estate troubled debt restructurings	**$2,316**	**$ 6,240**	**$8,556**	$2,992	$ 9,562	$12,554

(1) At December 31, 2018 and 2017, residential mortgage TDRs deemed collateral dependent totaled $1.6 billion and $2.8 billion, and included $960 million and $1.2 billion of loans classified as nonperforming and $605 million and $1.6 billion of loans classified as performing.

(2) Residential mortgage performing TDRs included $2.8 billion and $3.7 billion of loans that were fully-insured at December 31, 2018 and 2017.

(3) At December 31, 2018 and 2017, home equity TDRs deemed collateral dependent totaled $1.3 billion and $1.6 billion, and included $961 million and $1.2 billion of loans classified as nonperforming and $322 million and $388 million of loans classified as performing.

In addition to modifying consumer real estate loans, we work with customers who are experiencing financial difficulty by modifying credit card and other consumer loans. Credit card and other consumer loan modifications generally involve a reduction in the customer’s interest rate on the account and placing the customer on a fixed payment plan not exceeding 60 months, all of which are considered TDRs (the renegotiated TDR portfolio). Modifications of credit card and other consumer loans are made through renegotiation programs utilizing direct customer contact, but may also utilize external renegotiation programs. The renegotiated TDR portfolio is excluded in large part from Table 31 as substantially all of the loans remain on accrual status until either charged off or paid in full. At December 31, 2018 and 2017, our renegotiated TDR portfolio was $566 million and $490 million, of which $481 million and $426 million were current or less than 30 days past due under the modified terms. The increase in the renegotiated TDR portfolio was primarily driven by new renegotiated enrollments outpacing runoff of existing portfolios.

Commercial Portfolio Credit Risk Management

Credit risk management for the commercial portfolio begins with an assessment of the credit risk profile of the borrower or counterparty based on an analysis of its financial position. As part of the overall credit risk assessment, our commercial credit exposures are assigned a risk rating and are subject to approval based on defined credit approval standards. Subsequent to loan origination, risk ratings are monitored on an ongoing basis, and if necessary, adjusted to reflect changes in the financial condition,

cash flow, risk profile or outlook of a borrower or counterparty. In making credit decisions, we consider risk rating, collateral, country, industry and single-name concentration limits while also balancing these considerations with the total borrower or counterparty relationship. We use a variety of tools to continuously monitor the ability of a borrower or counterparty to perform under its obligations. We use risk rating aggregations to measure and evaluate concentrations within portfolios. In addition, risk ratings are a factor in determining the level of allocated capital and the allowance for credit losses.

As part of our ongoing risk mitigation initiatives, we attempt to work with clients experiencing financial difficulty to modify their loans to terms that better align with their current ability to pay. In situations where an economic concession has been granted to a borrower experiencing financial difficulty, we identify these loans as TDRs. For more information on our accounting policies regarding delinquencies, nonperforming status and net charge-offs for the commercial portfolio, see *Note 1 – Summary of Significant Accounting Principles* to the Consolidated Financial Statements.

Management of Commercial Credit Risk Concentrations

Commercial credit risk is evaluated and managed with the goal that concentrations of credit exposure continue to be aligned with our risk appetite. We review, measure and manage concentrations of credit exposure by industry, product, geography, customer relationship and loan size. We also review, measure and manage commercial real estate loans by geographic location and property type. In addition, within our non-U.S. portfolio, we evaluate exposures by region and by country. Tables 37, 40, 43 and 44 summarize our concentrations. We also utilize syndications of exposure to third parties, loan sales, hedging and other risk mitigation techniques to manage the size and risk profile of the commercial credit portfolio. For more information on our industry concentrations, see Commercial Portfolio Credit Risk Management – Industry Concentrations on page 63 and Table 40.

We account for certain large corporate loans and loan commitments, including issued but unfunded letters of credit which are considered utilized for credit risk management purposes, that exceed our single-name credit risk concentration guidelines under the fair value option. Lending commitments, both funded and unfunded, are actively managed and monitored, and as appropriate, credit risk for these lending relationships may be mitigated through the use of credit derivatives, with our credit view and market perspectives determining the size and timing of the hedging activity. In addition, we purchase credit protection to cover the funded portion as well as the unfunded portion of certain other credit exposures. To lessen the cost of obtaining our desired credit protection levels, credit exposure may be added within an industry, borrower or counterparty group by selling protection. These credit derivatives do not meet the requirements for treatment as accounting hedges. They are carried at fair value with changes in fair value recorded in other income.

In addition, we are a member of various securities and derivative exchanges and clearinghouses, both in the U.S. and

other countries. As a member, we may be required to pay a pro-rata share of the losses incurred by some of these organizations as a result of another member default and under other loss scenarios. For additional information, see *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements.

Commercial Credit Portfolio

During 2018, credit quality among large corporate borrowers was strong, and there was continued improvement in the energy portfolio. Credit quality of commercial real estate borrowers in most sectors remained stable with conservative LTV ratios. However, some of the commercial real estate markets experienced slowing tenant demand and decelerating rental income.

Total commercial utilized credit exposure increased $20.2 billion in 2018 to $621.0 billion primarily driven by commercial loan growth. The utilization rate for loans and leases, SBLCs and financial guarantees, and commercial letters of credit, in the aggregate, was 59 percent at both December 31, 2018 and 2017.

Table 33 presents commercial credit exposure by type for utilized, unfunded and total binding committed credit exposure. Commercial utilized credit exposure includes SBLCs and financial guarantees and commercial letters of credit that have been issued and for which we are legally bound to advance funds under prescribed conditions during a specified time period, and excludes exposure related to trading account assets. Although funds have not yet been advanced, these exposure types are considered utilized for credit risk management purposes.

Table 33 Commercial Credit Exposure by Type

	Commercial Utilized (1)		**Commercial Unfunded** (2, 3, 4)		**Total Commercial Committed**	
	December 31					
(Dollars in millions)	**2018**	2017	**2018**	2017	**2018**	2017
Loans and leases (5)	**$ 505,724**	$ 487,748	**$ 369,282**	$ 364,743	**$ 875,006**	$ 852,491
Derivative assets (6)	**43,725**	37,762	**—**	—	**43,725**	37,762
Standby letters of credit and financial guarantees	**34,941**	34,517	**491**	863	**35,432**	35,380
Debt securities and other investments	**25,425**	28,161	**4,250**	4,864	**29,675**	33,025
Loans held-for-sale	**9,090**	10,257	**14,812**	9,742	**23,902**	19,999
Commercial letters of credit	**1,210**	1,467	**168**	155	**1,378**	1,622

Other	**898**	888	**—**	—	**898**	888
Total	**$621,013**	$600,800	**$389,003**	$380,367	**$1,010,016**	$981,167

(1) Commercial utilized exposure includes loans of $3.7 billion and $4.8 billion and issued letters of credit with a notional amount of $100 million and $232 million accounted for under the fair value option at December 31, 2018 and 2017.

(2) Commercial unfunded exposure includes commitments accounted for under the fair value option with a notional amount of $3.0 billion and $4.6 billion at December 31, 2018 and 2017.

(3) Excludes unused business card lines, which are not legally binding.

(4) Includes the notional amount of unfunded legally binding lending commitments net of amounts distributed (i.e., syndicated or participated) to other financial institutions. The distributed amounts were $10.7 billion and $11.0 billion at December 31, 2018 and 2017.

(5) Includes credit risk exposure associated with assets under operating lease arrangements of $6.1 billion and $6.3 billion at December 31, 2018 and 2017.

(6) Derivative assets are carried at fair value, reflect the effects of legally enforceable master netting agreements and have been reduced by cash collateral of $32.4 billion and $34.6 billion at December 31, 2018 and 2017. Not reflected in utilized and committed exposure is additional non-cash derivative collateral held of $33.0 billion and $26.2 billion at December 31, 2018 and 2017, which consists primarily of other marketable securities.

Outstanding commercial loans and leases increased $18.2 billion during 2018 primarily in the U.S. commercial portfolio. The allowance for loan and lease losses for the commercial portfolio decreased $211 million to $4.8 billion at December 31, 2018. For additional information, see Allowance for Credit Losses on page 67. Table 34 presents our commercial loans and leases portfolio and related credit quality information at December 31, 2018 and 2017.

Table 34 Commercial Credit Quality

	Outstandings		Nonperforming		Accruing Past Due 90 Days or More	
	December 31					
(Dollars in millions)	**2018**	2017	**2018**	2017	**2018**	2017
Commercial and industrial:						
U.S. commercial	**$ 299,277**	$ 284,836	**$ 794**	$ 814	**$ 197**	$ 144
Non-U.S. commercial	**98,776**	97,792	**80**	299	**—**	3
Total commercial and industrial	**398,053**	382,628	**874**	1,113	**197**	147
Commercial real estate (1)	**60,845**	58,298	**156**	112	**4**	4
Commercial lease financing	**22,534**	22,116	**18**	24	**29**	19
	481,432	463,042	**1,048**	1,249	**230**	170
U.S. small business commercial (2)	**14,565**	13,649	**54**	55	**84**	75
Commercial loans excluding loans accounted for under the fair value option	**495,997**	476,691	**1,102**	1,304	**314**	245
Loans accounted for under the fair value option (3)	**3,667**	4,782	**—**	43	**—**	—
Total commercial loans and leases	**$ 499,664**	$ 481,473	**$ 1,102**	$ 1,347	**$ 314**	$ 245

(1) Includes U.S. commercial real estate of $56.6 billion and $54.8 billion and non-U.S. commercial real estate of $4.2 billion and $3.5 billion at December 31, 2018 and 2017.
(2) Includes card-related products.
(3) Commercial loans accounted for under the fair value option include U.S. commercial of $2.5 billion and $2.6 billion and non-U.S. commercial of $1.1 billion and $2.2 billion at December 31, 2018 and 2017. For more information on the fair value option, see Note 21 – Fair Value Optionto the Consolidated Financial Statements.

Table 35 presents net charge-offs and related ratios for our commercial loans and leases for 2018 and 2017. The decrease in net charge-offs of $378 million for 2018 was primarily driven by a single-name non-U.S. commercial charge-off of $292 million in 2017.

Table 35 Commercial Net Charge-offs and Related Ratios

	Net Charge-offs		Net Charge-off Ratios (1)	
(Dollars in millions)	**2018**	2017	**2018**	2017
Commercial and industrial:				
	$ 215	$ 232	**0.07 %**	0.08 %

U.S. commercial				
Non-U.S. commercial	**68**	440	**0.07**	0.48
Total commercial and industrial	**283**	672	**0.07**	0.18
Commercial real estate	**1**	9	**—**	0.02
Commercial lease financing	**(1)**	5	**(0.01)**	0.02
	283	686	**0.06**	0.15
U.S. small business commercial	**240**	215	**1.70**	1.60
Total commercial	**$ 523**	$ 901	**0.11**	0.20

(1) Net charge-off ratios are calculated as net charge-offs divided by average outstanding loans and leases excluding loans accounted for under the fair value option.

Table 36 presents commercial reservable criticized utilized exposure by loan type. Criticized exposure corresponds to the Special Mention, Substandard and Doubtful asset categories as defined by regulatory authorities. Total commercial reservable criticized utilized exposure decreased $2.5 billion, or 18 percent, during 2018 driven by broad-based improvements including the energy sector. At December 31, 2018 and 2017, 91 percent and 84 percent of commercial reservable criticized utilized exposure was secured.

Table 36 Commercial Reservable Criticized Utilized Exposure (1, 2)

	December 31			
(Dollars in millions)	**2018**		2017	
Commercial and industrial:				
U.S. commercial	**$ 7,986**	**2.43 %**	$ 9,891	3.15 %
Non-U.S. commercial	**1,013**	**0.97**	1,766	1.70
Total commercial and industrial	**8,999**	**2.08**	11,657	2.79
Commercial real estate	**936**	**1.50**	566	0.95
Commercial lease financing	**366**	**1.62**	581	2.63
	10,301	**1.99**	12,804	2.57
U.S. small business commercial	**760**	**5.22**	759	5.56
Total commercial reservable criticized utilized exposure (1)	**$ 11,061**	**2.08**	$ 13,563	2.65

(1) Total commercial reservable criticized utilized exposure includes loans and leases of $10.3 billion and $12.5 billion and commercial letters of credit of $781 million and $1.1 billion at December 31, 2018 and 2017.

(2) Percentages are calculated as commercial reservable criticized utilized exposure divided by total commercial reservable utilized exposure for each exposure category.

Commercial and Industrial

Commercial and industrial loans include U.S. commercial and non-U.S. commercial portfolios.

U.S. Commercial

At December 31, 2018, 70 percent of the U.S. commercial loan portfolio, excluding small business, was managed in *Global Banking,* 16 percent in *Global Markets*, 12 percent in *GWIM* (generally business-purpose loans for high net worth clients) and the remainder primarily in *Consumer Banking*. U.S. commercial loans increased $14.4 billion in 2018 primarily in *Global Banking*. Reservable criticized utilized exposure decreased $1.9 billion, or 19 percent, driven by broad-based improvements including the energy sector.

Non-U.S. Commercial

At December 31, 2018, 81 percent of the non-U.S. commercial loan portfolio was managed in *Global Banking* and 19 percent in *Global Markets*. Reservable criticized utilized exposure decreased $753 million, or 43 percent, and nonperforming loans and leases decreased $219 million, or 73 percent, due primarily to paydowns, sales and charge-offs. Net charge-offs decreased $372 million in 2018 primarily due to a single-name non-U.S. commercial charge-off of $292 million in 2017. For more information on the non-U.S. commercial portfolio, see Non-U.S. Portfolio on page 65.

Commercial Real Estate

Commercial real estate primarily includes commercial loans and leases secured by non-owner-occupied real estate and is

dependent on the sale or lease of the real estate as the primary source of repayment. The portfolio remains diversified across property types and geographic regions. California represented the largest state concentration at 23 percent of the commercial real estate loans and leases portfolio at both December 31, 2018 and 2017. The commercial real estate portfolio is predominantly managed in *Global Banking* and consists of loans made primarily to public and private developers, and commercial real estate firms. Outstanding loans increased $2.5 billion, or four percent, during 2018 to $60.8 billion due to new originations, including higher hold levels on syndicated loans, outpacing paydowns.

During 2018, we continued to see low default rates and solid credit quality in both the residential and non-residential portfolios. We use a number of proactive risk mitigation initiatives to reduce adversely rated exposure in the commercial real estate portfolio, including transfers of deteriorating exposures to management by independent special asset officers and the pursuit of loan restructurings or asset sales to achieve the best results for our customers and the Corporation.

Nonperforming commercial real estate loans and foreclosed properties increased $48 million, or 29 percent, during 2018 to $212 million, primarily due to a single-name downgrade.

Table 37 presents outstanding commercial real estate loans by geographic region, based on the geographic location of the collateral, and by property type.

Table 37 Outstanding Commercial Real Estate Loans

	December 31	
(Dollars in millions)	**2018**	2017
By Geographic Region		
California	**$ 14,002**	$ 13,607
Northeast	**10,895**	10,072
Southwest	**7,339**	6,970
Southeast	**5,726**	5,487
Midwest	**3,772**	3,769
Florida	**3,680**	3,170
Illinois	**2,989**	3,263

Midsouth	**2,919**	2,962
Northwest	**2,178**	2,657
Non-U.S.	**4,240**	3,538
Other [1]	**3,105**	2,803
Total outstanding commercial real estate loans	**$60,845**	$58,298
By Property Type		
Non-residential		
Office	**$17,246**	$16,718
Shopping centers / Retail	**8,798**	8,825
Multi-family rental	**7,762**	8,280
Hotels / Motels	**7,248**	6,344
Industrial / Warehouse	**5,379**	6,070
Unsecured	**2,956**	2,187
Multi-use	**2,848**	2,771
Other	**7,029**	5,645
Total non-residential	**59,266**	56,840
Residential	**1,579**	1,458
Total outstanding commercial real estate loans	**$60,845**	$58,298

(1) Includes unsecured loans to real estate investment trusts and national home builders whose portfolios of properties span multiple geographic regions and properties in the states of Colorado, Utah, Hawaii, Wyoming and Montana.

U.S. Small Business Commercial

The U.S. small business commercial loan portfolio is comprised of small business card loans and small business loans managed in *Consumer Banking*. Credit card-related products were 51 percent and 50 percent of the U.S. small business commercial portfolio at December 31, 2018 and 2017. Of the U.S. small business commercial net charge-offs, 95 percent and 90 percent were credit card-related products in 2018 and 2017.

Nonperforming Commercial Loans, Leases and Foreclosed Properties Activity

Table 38 presents the nonperforming commercial loans, leases and foreclosed properties activity during 2018 and 2017. Nonperforming loans do not include loans accounted for under the fair value option. During 2018, nonperforming commercial loans and leases decreased $202 million to $1.1 billion. At December

31, 2018, 93 percent of commercial nonperforming loans, leases and foreclosed properties were secured and 55 percent were contractually current. Commercial nonperforming loans were carried at 89 percent of their unpaid principal balance before consideration of the allowance for loan and lease losses as the carrying value of these loans has been reduced to the estimated collateral value less costs to sell.

Table 38 Nonperforming Commercial Loans, Leases and Foreclosed Properties Activity (1, 2)

(Dollars in millions)	**2018**	2017
Nonperforming loans and leases, January 1	**$1,304**	$1,703
Additions	**1,415**	1,616
Reductions:		
Paydowns	**(771)**	(930)
Sales	**(210)**	(136)
Returns to performing status (3)	**(246)**	(280)
Charge-offs	**(361)**	(455)
Transfers to foreclosed properties	**(12)**	(40)
Transfers to loans held-for-sale	**(17)**	(174)
Total net reductions to nonperforming loans and leases	**(202)**	(399)
Total nonperforming loans and leases, December 31	**1,102**	1,304
Foreclosed properties, December 31	**56**	52
Nonperforming commercial loans, leases and foreclosed properties, December 31	**$1,158**	$1,356
Nonperforming commercial loans and leases as a percentage of outstanding commercial loans and leases (4)	**0.22 %**	0.27 %
Nonperforming commercial loans, leases and foreclosed properties as a percentage of outstanding commercial loans, leases and foreclosed properties (4)	**0.23**	0.28

(1) Balances do not include nonperforming loans held-for-sale of $292 million and $339 million at December 31, 2018 and 2017.
(2) Includes U.S. small business commercial activity. Small business card loans are excluded as they are not classified as nonperforming.
(3) Commercial loans and leases may be returned to performing status when all principal and interest is current and full repayment of the remaining contractual principal and interest is expected, or when the loan otherwise becomes well-secured and is in the process of collection. TDRs are generally classified as performing after a sustained period of demonstrated payment performance.
(4) Outstanding commercial loans exclude loans accounted for under the fair value option.

Table 39 presents our commercial TDRs by product type and performing status. U.S. small business commercial TDRs are comprised of renegotiated small business card loans and small business loans. The renegotiated small business card loans are not classified as nonperforming as they are charged off no later than the end of the month in which the loan becomes 180 days past due. For more information on TDRs, see *Note 5 – Outstanding Loans and Leases* to the Consolidated Financial Statements.

Table 39 Commercial Troubled Debt Restructurings

	December 31, 2018			December 31, 2017		
(Dollars in millions)	**Nonperforming**	**Performing**	**Total**	Nonperforming	Performing	Total
Commercial and industrial:						
U.S. commercial	**$306**	**$ 1,092**	**$1,398**	$370	$ 866	$1,236
Non-U.S. commercial	**78**	**162**	**240**	11	219	230
Total commercial and industrial	**384**	**1,254**	**1,638**	381	1,085	1,466
	114	**6**	**120**	38	9	47

Commercial real estate						
Commercial lease financing	**3**	**68**	**71**	5	13	18
	501	**1,328**	**1,829**	424	1,107	1,531
U.S. small business commercial	**3**	**18**	**21**	4	15	19
Total commercial troubled debt restructurings	**$ 504**	**$ 1,346**	**$ 1,850**	$ 428	$ 1,122	$ 1,550

Industry Concentrations

Table 40 presents commercial committed and utilized credit exposure by industry and the total net credit default protection purchased to cover the funded and unfunded portions of certain credit exposures. Our commercial credit exposure is diversified across a broad range of industries. Total commercial committed exposure increased $28.8 billion, or three percent, during 2018 to $1.0 trillion. The increase in commercial committed exposure was concentrated in the Asset Managers and Funds, Pharmaceuticals and Biotechnology, and Capital Goods industry sectors. Increases were partially offset by reduced exposure to the Media, Food and Staples Retailing, and Energy industry sectors.

Industry limits are used internally to manage industry concentrations and are based on committed exposure that is allocated on an industry-by-industry basis. A risk management framework is in place to set and approve industry limits as well as to provide ongoing monitoring. The MRC oversees industry limit governance.

Asset Managers and Funds, our largest industry concentration with committed exposure of $107.9 billion, increased $16.8 billion, or 18 percent, during 2018. The change reflects an increase in exposure to several counterparties.

Real Estate, our second largest industry concentration with committed exposure of $86.5 billion, increased $2.7 billion, or three percent, during 2018. For more information on the commercial real estate and related portfolios, see Commercial Portfolio Credit Risk Management – Commercial Real Estate on page 62.

Capital Goods, our third largest industry concentration with committed exposure of $75.1 billion, increased $4.7 billion, or seven percent, during 2018. The increase in committed exposure occurred primarily as a result of increases in large conglomerates, as well as trading companies, distributors and electrical equipment companies, partially offset by a decrease in machinery companies.

Our energy-related committed exposure decreased $4.5 billion, or 12 percent, during 2018 to $32.3 billion. Energy sector net

charge-offs were $31 million in 2018 compared to $156 million in 2017. Energy sector reservable criticized exposure decreased $833 million during 2018 to $787 million due to improvement in credit quality coupled with exposure reductions. The energy allowance for credit losses decreased $225 million during 2018 to $335 million.

Table 40 Commercial Credit Exposure by Industry (1)

	Commercial Utilized		Total Commercial Committed (2)	
	December 31			
(Dollars in millions)	**2018**	2017	**2018**	2017
Asset managers and funds	**$ 71,756**	$ 59,190	**$ 107,888**	$ 91,092
Real estate (3)	**65,328**	61,940	**86,514**	83,773
Capital goods	**39,192**	36,705	**75,080**	70,417
Finance companies	**36,662**	34,050	**56,659**	53,107
Healthcare equipment and services	**35,763**	37,780	**56,489**	57,256
Government and public education	**43,675**	48,684	**54,749**	58,067
Materials	**27,347**	24,001	**51,865**	47,386
Retailing	**25,333**	26,117	**47,507**	48,796
Consumer services	**25,702**	27,191	**43,298**	43,605
Food, beverage and tobacco	**23,586**	23,252	**42,745**	42,815
Commercial services and supplies	**22,623**	22,100	**39,349**	35,496
Energy	**13,727**	16,345	**32,279**	36,765
Transportation	**22,814**	21,704	**31,523**	29,946
Global commercial banks	**26,269**	29,491	**28,321**	31,764
Utilities	**12,035**	11,342	**27,623**	27,935
Technology hardware and equipment	**13,014**	10,728	**26,228**	22,071
Individuals and trusts	**18,643**	18,549	**25,019**	25,097
Media	**12,132**	19,155	**24,502**	33,955
Pharmaceuticals and biotechnology	**7,430**	5,653	**23,634**	18,623
Vehicle dealers	**17,603**	16,896	**20,446**	20,361
Consumer durables and	**9,904**	8,859	**20,199**	17,296

apparel				
Software and services	**8,809**	8,562	**19,172**	18,202
Insurance	**8,674**	6,411	**15,807**	12,990
Telecommunication services	**8,686**	6,389	**14,166**	13,108
Automobiles and components	**7,131**	5,988	**13,893**	13,318
Food and staples retailing	**4,787**	4,955	**9,093**	15,589
Religious and social organizations	**3,757**	4,454	**5,620**	6,318
Financial markets infrastructure (clearinghouses)	**2,382**	688	**4,107**	2,403
Other	**6,249**	3,621	**6,241**	3,616
Total commercial credit exposure by industry	**$621,013**	$600,800	**$1,010,016**	$981,167
Net credit default protection purchased on total commitments (4)			**$(2,663)**	$(2,129)

(1) Includes U.S. small business commercial exposure.

(2) Includes the notional amount of unfunded legally binding lending commitments net of amounts distributed (i.e., syndicated or participated) to other financial institutions. The distributed amounts were $10.7 billion and $11.0 billion at December 31, 2018 and 2017.

(3) Industries are viewed from a variety of perspectives to best isolate the perceived risks. For purposes of this table, the real estate industry is defined based on the primary business activity of the borrowers or counterparties using operating cash flows and primary source of repayment as key factors.

(4) Represents net notional credit protection purchased. For additional information, see Commercial Portfolio Credit Risk Management – Risk Mitigation.

Risk Mitigation

We purchase credit protection to cover the funded portion as well as the unfunded portion of certain credit exposures. To lower the cost of obtaining our desired credit protection levels, we may add credit exposure within an industry, borrower or counterparty group by selling protection.

At December 31, 2018 and 2017, net notional credit default protection purchased in our credit derivatives portfolio to hedge our funded and unfunded exposures for which we elected the fair

value option, as well as certain other credit exposures, was $2.7 billion and $2.1 billion. We recorded net losses of $2 million for 2018 compared to net losses of $66 million in 2017 on these positions. The gains and losses on these instruments were offset by gains and losses on the related exposures. The Value-at-Risk (VaR) results for these exposures are included in the fair value option portfolio information in Table 47. For additional information, see Trading Risk Management on page 71.

Tables 41 and 42 present the maturity profiles and the credit exposure debt ratings of the net credit default protection portfolio at December 31, 2018 and 2017.

Table 41 Net Credit Default Protection by Maturity

	December 31	
	2018	2017
Less than or equal to one year	**20 %**	42 %
Greater than one year and less than or equal to five years	**78**	58
Greater than five years	**2**	—
Total net credit default protection	**100 %**	100 %

Table 42 Net Credit Default Protection by Credit Exposure Debt Rating

	Net Notional (1)	**Percent of Total**	Net Notional (1)	Percent of Total
	December 31			
(Dollars in millions)	**2018**		2017	
Ratings (2, 3)				
A	**$(700)**	**26.3 %**	$(280)	13.2 %
BBB	**(501)**	**18.8**	(459)	21.6
BB	**(804)**	**30.2**	(893)	41.9
B	**(422)**	**15.8**	(403)	18.9
CCC and below	**(205)**	**7.7**	(84)	3.9
NR (4)	**(31)**	**1.2**	(10)	0.5
Total net credit default protection	**$(2,663)**	**100.0%**	$(2,129)	100.0%

(1) Represents net credit default protection purchased.
(2) Ratings are refreshed on a quarterly basis.
(3) Ratings of BBB- or higher are considered to meet the definition of investment grade.
(4) NR is comprised of index positions held and any names that have not been rated.

In addition to our net notional credit default protection purchased to cover the funded and unfunded portion of certain credit exposures, credit derivatives are used for market-making activities for clients and establishing positions intended to profit from directional or relative value changes. We execute the majority of our credit derivative trades in the OTC market with large, multinational financial institutions, including broker-dealers and, to a lesser degree, with a variety of other investors. Because these transactions are executed in the OTC market, we are subject to settlement risk. We are also subject to credit risk in the event that these counterparties fail to perform under the terms of these contracts. In order to properly reflect counterparty credit risk, we record counterparty credit risk valuation adjustments on certain derivative assets, including our purchased credit default protection.

In most cases, credit derivative transactions are executed on a daily margin basis. Therefore, events such as a credit downgrade, depending on the ultimate rating level, or a breach of credit covenants would typically require an increase in the amount of collateral required by the counterparty, where applicable, and/or allow us to take additional protective measures such as early termination of all trades. For more information on credit derivatives and counterparty credit risk valuation adjustments, see *Note 3 – Derivatives* to the Consolidated Financial Statements.

Non-U.S. Portfolio

Our non-U.S. credit and trading portfolios are subject to country risk. We define country risk as the risk of loss from unfavorable economic and political conditions, currency fluctuations, social instability and changes in government policies. A risk management framework is in place to measure, monitor and manage non-U.S. risk and exposures. In addition to the direct risk of doing business in a country, we also are exposed to indirect country risks (e.g., related to the collateral received on secured financing transactions or related to client clearing activities). These indirect exposures are managed in the normal course of business through credit, market and operational risk governance, rather than through country risk governance.

Table 43 presents our 20 largest non-U.S. country exposures at December 31, 2018. These exposures accounted for 89 percent and 86 percent of our total non-U.S. exposure at December 31, 2018 and 2017. Net country exposure for these 20 countries increased $44.1 billion in 2018, primarily driven by increased placements with central banks in the U.K., Japan and Germany.

Non-U.S. exposure is presented on an internal risk management basis and includes sovereign and non-sovereign credit exposure, securities and other investments issued by or domiciled in countries other than the U.S. Funded loans and loan equivalents include loans, leases, and other extensions of credit and funds, including letters of credit and due from placements. Unfunded commitments are the undrawn portion of legally binding commitments related to loans and loan equivalents. Net counterparty exposure includes the fair value of derivatives, including the counterparty risk associated with credit default swaps (CDS), and secured financing transactions. Securities and other investments are carried at fair value and long securities exposures are netted against short exposures with the same underlying issuer to, but not below, zero. Net country exposure represents country exposure less hedges and credit default protection purchased, net of credit default protection sold.

Table 43 Top 20 Non-U.S. Countries Exposure

(Dollars in millions)	Funded Loans and Loan Equivalents	Unfunded Loan Commitments	Net Counterparty Exposure	Securities/ Other Investments	Country Exposure at December 31 2018	Hedges and Credit Default Protection	**Net Country Exposure at December 31 2018**	Increase (Decrease) from December 31 2017
United Kingdom	$ 28,833	$ 20,410	$ 6,419	$ 2,639	$ 58,301	$ (3,447)	**$ 54,854**	$ 17,259
Germany	24,856	6,823	1,835	443	33,957	(5,300)	**28,657**	7,154
Japan	17,762	1,316	1,023	1,341	21,442	(1,419)	**20,023**	10,933
Canada	7,388	7,234	1,641	3,773	20,036	(521)	**19,515**	792
China	12,774	681	975	495	14,925	(284)	**14,641**	(1,284)
France	7,137	5,849	1,331	1,214	15,531	(2,880)	**12,651**	2,108
Netherlands	8,405	2,992	389	973	12,759	(1,182)	**11,577**	3,110
India	7,147	451	312	3,379	11,289	(177)	**11,112**	615
Brazil	6,651	544	209	3,172	10,576	(327)	**10,249**	(467)
Australia	5,173	3,132	571	1,507	10,383	(453)	**9,930**	(659)
South Korea	5,634	463	897	2,456	9,450	(280)	**9,170**	1,269
Switzerland	5,494	2,580	335	201	8,610	(846)	**7,764**	1,967
Hong Kong	5,287	442	321	1,224	7,274	(38)	**7,236**	(1,442)
Mexico	3,506	1,275	140	1,444	6,365	(129)	**6,236**	749
Belgium	4,684	1,016	103	147	5,950	(372)	**5,578**	1,613
Singapore	3,330	125	362	1,770	5,587	(70)	**5,517**	(746)
Spain	3,769	1,138	290	792	5,989	(1,339)	**4,650**	1,542
United Arab Emirates	3,371	135	138	55	3,699	(50)	**3,649**	262
Taiwan	2,311	13	288	623	3,235	—	**3,235**	523
Italy	2,372	1,065	491	597	4,525	(1,444)	**3,081**	(1,165)
Total top 20 non-U.S. countries exposure	$ 165,884	$ 57,684	$ 18,070	$ 28,245	$ 269,883	$ (20,558)	**$ 249,325**	$ 44,133

A number of economic conditions and geopolitical events have given rise to risk aversion in certain emerging markets. Our largest emerging market country exposure at December 31, 2018 was China, with net exposure of $14.6 billion, concentrated in large state-owned companies, subsidiaries of multinational corporations and commercial banks.

The outlook for policy direction and therefore economic performance in the EU remains uncertain as a consequence of reduced political cohesion among EU countries. Additionally, we believe that the uncertainty in the U.K.'s ability to negotiate a favorable exit from the EU will further weigh on economic performance. Our largest EU country exposure at December 31, 2018 was the U.K. with net exposure of $54.9 billion, a $17.3 billion increase from December 31, 2017. The increase was driven by corporate loan growth and increased placements with the central bank as part of liquidity management.

Markets have reacted negatively to the escalating tensions between the U.S. and several key trading partners. We are closely

monitoring our exposures to tariff-sensitive industries and our international exposure, particularly to countries that account for a large percentage of U.S. trade.

Table 44 presents countries where total cross-border exposure exceeded one percent of our total assets. At December 31, 2018, the U.K. and France were the only countries where total cross-border exposure exceeded one percent of our total assets. At December 31, 2018, Germany and China had total cross-border exposure of $20.4 billion and $19.5 billion representing 0.87 percent and 0.83 percent of our total assets. No other countries had total cross-border exposure that exceeded 0.75 percent of our total assets at December 31, 2018.

Cross-border exposure includes the components of Country Risk Exposure as detailed in Table 43 as well as the notional amount of cash loaned under secured financing agreements. Local exposure, defined as exposure booked in local offices of a respective country with clients in the same country, is excluded.

Table 44 Total Cross-border Exposure Exceeding One Percent of Total Assets

(Dollars in millions)	December 31	Public Sector	Banks	Private Sector	Cross-border Exposure	Exposure as a Percent of Total Assets
United Kingdom	**2018**	**$1,505**	**$3,458**	**$46,191**	**$ 51,154**	**2.17 %**
	2017	923	2,984	47,205	51,112	2.24
	2016	2,975	4,557	42,105	49,637	2.27
France	**2018**	**633**	**2,385**	**29,847**	**32,865**	**1.40**
	2017	2,964	1,521	27,903	32,388	1.42
	2016	4,956	1,205	23,193	29,354	1.34

Provision for Credit Losses

The provision for credit losses decreased $114 million to $3.3 billion in 2018 compared to 2017 primarily due to improvement in the commercial portfolio, partially offset by an increase in the consumer portfolio. The provision for credit losses was $481 million lower than net charge-offs for 2018, resulting in a reduction in the allowance for credit losses. This compared to a reduction of $583 million in the allowance for credit losses in 2017.

The provision for credit losses for the consumer portfolio increased $222 million to $2.9 billion in 2018 compared to 2017. The increase was primarily driven by a slower pace of improvement in the consumer real estate portfolio, and portfolio seasoning and loan growth in the U.S. credit card portfolio, partially offset by the impact of the sale of the non-U.S. consumer credit card business in 2017.

The provision for credit losses for the commercial portfolio, including unfunded lending commitments, decreased $336 million to $333 million in 2018 compared to 2017. The decrease was primarily driven by a 2017 single-name non-U.S. commercial charge-off and improvement in the commercial portfolio.

Allowance for Credit Losses

Allowance for Loan and Lease Losses

The allowance for loan and lease losses is comprised of two components. The first component covers nonperforming commercial loans and TDRs. The second component covers loans and leases on which there are incurred losses that are not yet individually identifiable, as well as incurred losses that may not be represented in the loss forecast models. We evaluate the adequacy of the allowance for loan and lease losses based on the total of these two components, each of which is described in more detail below. The allowance for loan and lease losses excludes loans held-for-sale (LHFS) and loans accounted for under the fair value option as the fair value reflects a credit risk component.

The first component of the allowance for loan and lease losses covers both nonperforming commercial loans and all TDRs within the consumer and commercial portfolios. These loans are subject to impairment measurement based on the present value of projected future cash flows discounted at the loan's original effective interest rate, or in certain circumstances, impairment may also be based upon the collateral value or the loan's observable market price if available. Impairment measurement for the renegotiated consumer credit card, small business credit card and unsecured consumer TDR portfolios is based on the present value of projected cash flows discounted using the average portfolio contractual interest rate, excluding promotionally priced loans, in effect prior to restructuring. For purposes of computing this specific loss component of the allowance, larger impaired loans are evaluated individually and smaller impaired loans are evaluated as a pool using historical experience for the respective product types and risk ratings of the loans.

The second component of the allowance for loan and lease losses covers the remaining consumer and commercial loans and leases that have incurred losses that are not yet individually identifiable. The allowance for consumer (including credit card and other consumer loans) and certain homogeneous commercial loan and lease products is based on aggregated portfolio evaluations, which include both quantitative and qualitative components, generally by product type. Loss forecast models are utilized that consider a variety of factors including, but not limited to, historical loss experience, estimated defaults or foreclosures based on portfolio trends, delinquencies, economic trends and credit scores. Our consumer real estate loss forecast model estimates

the portion of loans that will default based on individual loan attributes, the most significant of which are refreshed LTV or CLTV, and borrower credit score as well as vintage and geography, all of which are further broken down into current delinquency status. Additionally, we incorporate the delinquency status of underlying first-lien loans on our junior-lien home equity portfolio in our allowance process. Incorporating refreshed LTV and CLTV into our probability of default allows us to factor the impact of changes in home prices into our allowance for loan and lease losses. These loss forecast models are updated on a quarterly basis to incorporate information reflecting the current economic environment. As of December 31, 2018, the loss forecast process resulted in reductions in the allowance related to the residential mortgage and home equity portfolios compared to December 31, 2017.

The allowance for commercial loan and lease losses is established by product type after analyzing historical loss experience, internal risk rating, current economic conditions, industry performance trends, geographic and obligor concentrations within each portfolio and any other pertinent information. The statistical models for commercial loans are generally updated annually and utilize our historical database of actual defaults and other data, including external default data. The loan risk ratings and composition of the commercial portfolios used to calculate the allowance are updated quarterly to incorporate the most recent data reflecting the current economic environment. For risk-rated commercial loans, we estimate the probability of default and the loss given default (LGD) based on our historical experience of defaults and credit losses. Factors considered when assessing the internal risk rating include the value of the underlying collateral, if applicable, the industry in which the obligor operates, the obligor's liquidity and other financial indicators, and other quantitative and qualitative factors relevant to the obligor's credit risk. As of December 31, 2018, the allowance for the U.S. commercial and non-U.S. commercial portfolios decreased compared to December 31, 2017.

Also included within the second component of the allowance for loan and lease losses are reserves to cover losses that are incurred but, in our assessment, may not be adequately represented in the historical loss data used in the loss forecast models. For example, factors that we consider include, among others, changes in lending policies and procedures, changes in economic and business conditions, changes in the nature and size of the portfolio, changes in portfolio concentrations, changes in the volume and severity of past due loans and nonaccrual loans, the effect of external factors such as competition, and legal and regulatory requirements. Further, we consider the inherent uncertainty in mathematical models that are built upon historical data.

During 2018, the factors that impacted the allowance for loan and lease losses included improvement in the credit quality of the consumer real estate portfolios driven by continuing improvements in the U.S. economy and strong labor markets, proactive credit risk management initiatives and the impact of high credit quality originations. Evidencing the improvements in the U.S. economy and strong labor markets are low levels of unemployment and increases in home prices. In addition to these improvements, in the consumer portfolio, nonperforming consumer loans decreased $1.3 billion in 2018 as returns to performing status, loan sales, paydowns and charge-offs continued to outpace new nonaccrual loans. During 2018, the allowance for loan and lease losses in the commercial portfolio reflected decreased energy reserves primarily driven by improvement in energy exposures including reservable criticized utilized exposures.

We monitor differences between estimated and actual incurred loan and lease losses. This monitoring process includes periodic assessments by senior management of loan and lease portfolios and the models used to estimate incurred losses in those portfolios.

The allowance for loan and lease losses for the consumer portfolio, as presented in Table 45, was $4.8 billion at December 31, 2018, a decrease of $581 million from December 31, 2017. The decrease was primarily in the consumer real estate portfolio, partially offset by an increase in the U.S. credit card portfolio. The reduction in the allowance for the consumer real estate portfolio was due to improved home prices, lower nonperforming loans and a decrease in loan balances in our non-core portfolio. The increase in the allowance for the U.S. credit card portfolio was driven by portfolio seasoning and loan growth.

The allowance for loan and lease losses for the commercial portfolio, as presented in Table 45, was $4.8 billion at December 31, 2018, a decrease of $211 million from December 31, 2017 primarily driven by improvement in energy exposures. Commercial reservable criticized utilized exposure decreased to $11.1 billion at December 31, 2018 from $13.6 billion (to 2.08 percent from 2.65 percent of total commercial reservable utilized exposure) at December 31, 2017, driven by broad-based improvements including the energy sector. Nonperforming commercial loans decreased to $1.1 billion at December 31, 2018 from $1.3 billion (to 0.22 percent from 0.27 percent of outstanding commercial loans excluding loans accounted for under the fair value option)

at December 31, 2017. See Tables 34, 35 and 36 for more details on key commercial credit statistics.

The allowance for loan and lease losses as a percentage of total loans and leases outstanding was 1.02 percent at December 31, 2018 compared to 1.12 percent at December 31, 2017.

Reserve for Unfunded Lending Commitments

In addition to the allowance for loan and lease losses, we also estimate probable losses related to unfunded lending commitments such as letters of credit, financial guarantees, unfunded bankers' acceptances and binding loan commitments, excluding commitments accounted for under the fair value option. Unfunded lending commitments are subject to the same assessment as funded loans, including estimates of probability of default and LGD. Due to the nature of unfunded commitments, the estimate of probable losses must also consider utilization. To estimate the portion of these undrawn commitments that is likely to be drawn by a borrower at the time of estimated default, analyses of our historical experience are applied to the unfunded commitments to estimate the funded exposure at default (EAD). The expected loss for unfunded lending commitments is the product of the probability of default, the LGD and the EAD, adjusted for any qualitative factors including economic uncertainty and inherent imprecision in models.

The reserve for unfunded lending commitments was $797 million at December 31, 2018 compared to $777 million at December 31, 2017.

Table 45 Allocation of the Allowance for Credit Losses by Product Type

(Dollars in millions)	**December 31, 2018**			December 31, 2017		
	Amount	**Percent of Total**	**Percent of Loans and Leases Outstanding** (1)	Amount	Percent of Total	Percent of Loans and Leases Outstanding (1)
Allowance for loan and lease losses						
Residential mortgage	**$ 422**	**4.40 %**	**0.20 %**	$ 701	6.74 %	0.34 %
Home equity	**506**	**5.27**	**1.05**	1,019	9.80	1.76
U.S. credit card	**3,597**	**37.47**	**3.66**	3,368	32.41	3.50
Direct/Indirect consumer	**248**	**2.58**	**0.27**	264	2.54	0.27
Other consumer	**29**	**0.30**	**n/m**	31	0.30	n/m
Total consumer	**4,802**	**50.02**	**1.08**	5,383	51.79	1.18
U.S. commercial (2)	**3,010**	**31.35**	**0.96**	3,113	29.95	1.04

Non-U.S. commercial	**677**	**7.05**	**0.69**	803	7.73	0.82
Commercial real estate	**958**	**9.98**	**1.57**	935	9.00	1.60
Commercial lease financing	**154**	**1.60**	**0.68**	159	1.53	0.72
Total commercial	**4,799**	**49.98**	**0.97**	5,010	48.21	1.05
Allowance for loan and lease losses (3)	**9,601**	**100.00%**	**1.02**	10,393	100.00%	1.12
Reserve for unfunded lending commitments	**797**			777		
Allowance for credit losses	**$10,398**			$11,170		

Ratios are calculated as allowance for loan and lease losses as a percentage of loans and leases outstanding excluding loans accounted for under the fair value option.

(1) Consumer loans accounted for under the fair value option include residential mortgage loans of $336 million and $567 million and home equity loans of $346 million and $361 million at December 31, 2018 and 2017. Commercial loans accounted for under the fair value option include U.S. commercial loans of $2.5 billion and $2.6 billion and non-U.S. commercial loans of $1.1 billion and $2.2 billion at December 31, 2018 and 2017.

(2) Includes allowance for loan and lease losses for U.S. small business commercial loans of $474 million and $439 million at December 31, 2018 and 2017.

(3) Includes $91 million and $289 million of valuation allowance presented with the allowance for loan and lease losses related to PCI loans at December 31, 2018 and 2017.

n/m = not meaningful

Table 46 presents a rollforward of the allowance for credit losses, which includes the allowance for loan and lease losses and the reserve for unfunded lending commitments, for 2018 and 2017.

Table 46 Allowance for Credit Losses

(Dollars in millions)	**2018**	2017
Allowance for loan and lease losses, January 1	**$10,393**	$11,237
Loans and leases charged off		
Residential mortgage	**(207)**	(188)
Home equity	**(483)**	(582)
U.S. credit card	**(3,345)**	(2,968)
Non-U.S. credit card [1]	**—**	(103)
Direct/Indirect consumer	**(495)**	(491)
Other consumer	**(197)**	(212)
Total consumer charge-offs	**(4,727)**	(4,544)
U.S. commercial [2]	**(575)**	(589)
Non-U.S. commercial	**(82)**	(446)
Commercial real estate	**(10)**	(24)
Commercial lease financing	**(8)**	(16)
Total commercial charge-offs	**(675)**	(1,075)
Total loans and leases charged off	**(5,402)**	(5,619)
Recoveries of loans and leases previously charged off		
Residential mortgage	**179**	288
Home equity	**485**	369
U.S. credit card	**508**	455
Non-U.S. credit card [1]	**—**	28
Direct/Indirect consumer	**300**	277
Other consumer	**15**	49
Total consumer recoveries	**1,487**	1,466
U.S. commercial [3]	**120**	142
Non-U.S. commercial	**14**	6
Commercial real estate	**9**	15
Commercial lease financing	**9**	11
Total commercial recoveries	**152**	174
Total recoveries of loans and leases previously charged off	**1,639**	1,640
Net charge-offs	**(3,763)**	(3,979)
Write-offs of PCI loans	**(273)**	(207)
Provision for loan and lease losses	**3,262**	3,381
Other [4]	**(18)**	(39)
Allowance for loan and lease losses, December 31	**9,601**	10,393
Reserve for unfunded lending commitments, January 1	**777**	762
Provision for unfunded lending commitments	**20**	15
Reserve for unfunded lending commitments, December 31	**797**	777
Allowance for credit losses, December 31	**$10,398**	$11,170
Loan and allowance ratios:		
Loans and leases outstanding at December 31 [5]	**$942,546**	$931,039
	1.02 %	1.12 %

Allowance for loan and lease losses as a percentage of total loans and leases outstanding at December 31 [5]		
Consumer allowance for loan and lease losses as a percentage of total consumer loans and leases outstanding at December 31 [6]	**1.08**	1.18
Commercial allowance for loan and lease losses as a percentage of total commercial loans and leases outstanding at December 31 [7]	**0.97**	1.05
Average loans and leases outstanding [5]	**$ 927,531**	$ 911,988
Net charge-offs as a percentage of average loans and leases outstanding [5, 8]	**0.41 %**	0.44 %
Net charge-offs and PCI write-offs as a percentage of average loans and leases outstanding [5]	**0.44**	0.46
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases at December 31 [5]	**194**	161
Ratio of the allowance for loan and lease losses at December 31 to net charge-offs [8]	**2.55**	2.61
Ratio of the allowance for loan and lease losses at December 31 to net charge-offs and PCI write-offs	**2.38**	2.48
Amounts included in allowance for loan and lease losses for loans and leases that are excluded from nonperforming loans and leases at December 31 [9]	**$ 4,031**	$ 3,971
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases, excluding the allowance for loan and lease losses for loans and leases that are excluded from nonperforming loans and leases at December 31 [5, 9]	**113 %**	99 %

(1) Represents net charge-offs related to the non-U.S. credit card loan portfolio, which was sold in 2017.

(2) Includes U.S. small business commercial charge-offs of $287 million and $258 million in 2018 and 2017.

(3) Includes U.S. small business commercial recoveries of $47 million and $43 million in 2018 and 2017.

(4) Primarily represents the net impact of portfolio sales, consolidations and deconsolidations, foreign currency translation adjustments, transfers to held for sale and certain other reclassifications.

(5) Outstanding loan and lease balances and ratios do not include loans accounted for under the fair value option of $4.3 billion and $5.7 billion at December 31, 2018 and 2017. Average loans accounted for under the fair value option were $5.5 billion and $6.7 billion in 2018 and 2017.

(6) Excludes consumer loans accounted for under the fair value option of $682 million and $928 million at December 31, 2018 and 2017.

(7) Excludes commercial loans accounted for under the fair value option of $3.7 billion and $4.8 billion at December 31, 2018 and 2017.

(8) Net charge-offs exclude $273 million and $207 million of write-offs in the PCI loan portfolio in 2018 and 2017. For more information on PCI write-offs, see Consumer Portfolio Credit Risk Management – Purchased Credit-impaired Loan Portfolio on page57.

(9) Primarily includes amounts allocated to U.S. credit card and unsecured consumer lending portfolios in *Consumer Banking* and PCI loans in *All Other*.

Market Risk Management

Market risk is the risk that changes in market conditions may adversely impact the value of assets or liabilities, or otherwise negatively impact earnings. This risk is inherent in the financial instruments associated with our operations, primarily within our *Global Markets* segment. We are also exposed to these risks in other areas of the Corporation (e.g., our ALM activities). In the event of market stress, these risks could have a material impact on our results. For more information, see Interest Rate Risk Management for the Banking Book on page 74.

Our traditional banking loan and deposit products are non-trading positions and are generally reported at amortized cost for assets or the amount owed for liabilities (historical cost). However, these positions are still subject to changes in economic value based on varying market conditions, with one of the primary risks being changes in the levels of interest rates. The risk of adverse changes in the economic value of our non-trading positions arising from changes in interest rates is managed through our ALM activities. We have elected to account for certain assets and liabilities under the fair value option.

Our trading positions are reported at fair value with changes reflected in income. Trading positions are subject to various changes in market-based risk factors. The majority of this risk is generated by our activities in the interest rate, foreign exchange, credit, equity and commodities markets. In addition, the values of assets and liabilities could change due to market liquidity, correlations across markets and expectations of market volatility. We seek to manage these risk exposures by using a variety of techniques that encompass a broad range of financial instruments. The key risk management techniques are discussed in more detail in the Trading Risk Management section.

Global Risk Management is responsible for providing senior management with a clear and comprehensive understanding of the trading risks to which we are exposed. These responsibilities include ownership of market risk policy, developing and maintaining quantitative risk models, calculating aggregated risk measures, establishing and monitoring position limits consistent with risk appetite, conducting daily reviews and analysis of trading inventory, approving material risk exposures and fulfilling regulatory requirements. Market risks that impact businesses outside of *Global Markets* are monitored and governed by their respective governance functions.

Quantitative risk models, such as VaR, are an essential component in evaluating the market risks within a portfolio. The Enterprise Model Risk Committee (EMRC), a subcommittee of the MRC, is responsible for providing management oversight and approval of model risk management and governance. The EMRC defines model risk standards, consistent with our risk framework and risk appetite, prevailing regulatory guidance and industry best practice. Models must meet certain validation criteria, including effective challenge of the model development process and a sufficient demonstration of developmental evidence incorporating a comparison of alternative theories and approaches. The EMRC oversees that model standards are consistent with model risk requirements and monitors the effective challenge in the model validation process across the Corporation. In addition, the relevant stakeholders must agree on any required actions or restrictions to the models and maintain a stringent monitoring process for continued compliance.

Interest Rate Risk

Interest rate risk represents exposures to instruments whose values vary with the level or volatility of interest rates. These instruments include, but are not limited to, loans, debt securities,

certain trading-related assets and liabilities, deposits, borrowings and derivatives. Hedging instruments used to mitigate these risks include derivatives such as options, futures, forwards and swaps.

Foreign Exchange Risk

Foreign exchange risk represents exposures to changes in the values of current holdings and future cash flows denominated in currencies other than the U.S. dollar. The types of instruments exposed to this risk include investments in non-U.S. subsidiaries, foreign currency-denominated loans and securities, future cash flows in foreign currencies arising from foreign exchange transactions, foreign currency-denominated debt and various foreign exchange derivatives whose values fluctuate with changes in the level or volatility of currency exchange rates or non-U.S. interest rates. Hedging instruments used to mitigate this risk include foreign exchange options, currency swaps, futures, forwards, and foreign currency-denominated debt and deposits.

Mortgage Risk

Mortgage risk represents exposures to changes in the values of mortgage-related instruments. The values of these instruments are sensitive to prepayment rates, mortgage rates, agency debt ratings, default, market liquidity, government participation and interest rate volatility. Our exposure to these instruments takes several forms. For example, we trade and engage in market-making activities in a variety of mortgage securities including whole loans, pass-through certificates, commercial mortgages and collateralized mortgage obligations including collateralized debt obligations using mortgages as underlying collateral. In addition, we originate a variety of MBS, which involves the accumulation of mortgage-related loans in anticipation of eventual securitization, and we may hold positions in mortgage securities and residential mortgage loans as part of the ALM portfolio. We also record MSRs as part of our mortgage origination activities. Hedging instruments used to mitigate this risk include derivatives such as options, swaps, futures and forwards as well as securities including MBS and U.S. Treasury securities. For more information, see Mortgage Banking Risk Management on page 76.

Equity Market Risk

Equity market risk represents exposures to securities that represent an ownership interest in a corporation in the form of domestic and foreign common stock or other equity-linked instruments. Instruments that would lead to this exposure include, but are not limited to, the following: common stock, exchange-traded funds, American Depositary Receipts, convertible bonds, listed equity options (puts and calls), OTC equity options, equity total return swaps, equity index futures and other equity derivative products. Hedging instruments used to mitigate this risk include options, futures, swaps, convertible bonds and cash positions.

Commodity Risk

Commodity risk represents exposures to instruments traded in the petroleum, natural gas, power and metals markets. These instruments consist primarily of futures, forwards, swaps and options. Hedging instruments used to mitigate this risk include options, futures and swaps in the same or similar commodity product, as well as cash positions.

Issuer Credit Risk

Issuer credit risk represents exposures to changes in the creditworthiness of individual issuers or groups of issuers. Our portfolio is exposed to issuer credit risk where the value of an asset may be adversely impacted by changes in the levels of credit spreads, by credit migration or by defaults. Hedging instruments used to mitigate this risk include bonds, CDS and other credit fixed-income instruments.

Market Liquidity Risk

Market liquidity risk represents the risk that the level of expected market activity changes dramatically and, in certain cases, may even cease. This exposes us to the risk that we will not be able to transact business and execute trades in an orderly manner which may impact our results. This impact could be further exacerbated if expected hedging or pricing correlations are compromised by disproportionate demand or lack of demand for certain instruments. We utilize various risk mitigating techniques as discussed in more detail in Trading Risk Management.

Trading Risk Management

To evaluate risk in our trading activities, we focus on the actual and potential volatility of revenues generated by individual positions as well as portfolios of positions. Various techniques and procedures are utilized to enable the most complete understanding of these risks. Quantitative measures of market risk are evaluated on a daily basis from a single position to the portfolio of the Corporation. These measures include sensitivities of positions to various market risk factors, such as the potential impact on revenue from a one basis point change in interest rates, and statistical measures utilizing both actual and hypothetical market moves, such as VaR and stress testing. Periods of extreme market stress influence the reliability of these techniques to varying degrees. Qualitative evaluations of market risk utilize the suite of quantitative risk measures while understanding each of their respective limitations. Additionally, risk managers independently evaluate the risk of the portfolios under the current market environment and potential future environments.

VaR is a common statistic used to measure market risk as it allows the aggregation of market risk factors, including the effects of portfolio diversification. A VaR model simulates the value of a portfolio under a range of scenarios in order to generate a distribution of potential gains and losses. VaR represents the loss a portfolio is not expected to exceed more than a certain number of times per period, based on a specified holding period, confidence level and window of historical data. We use one VaR model consistently across the trading portfolios and it uses a historical simulation approach based on a three-year window of historical data. Our primary VaR statistic is equivalent to a 99 percent confidence level. This means that for a VaR with a one-day holding period, there should not be losses in excess of VaR, on average, 99 out of 100 trading days.

Within any VaR model, there are significant and numerous assumptions that will differ from company to company. The accuracy of a VaR model depends on the availability and quality of historical data for each of the risk factors in the portfolio. A VaR model may require additional modeling assumptions for new products that do not have the necessary historical market data or for less liquid positions for which accurate daily prices are not consistently available. For positions with insufficient historical data for the VaR calculation, the process for establishing an appropriate proxy is based on fundamental and statistical analysis of the new product or less liquid position. This analysis identifies reasonable alternatives that replicate both the expected volatility and correlation to other market risk factors that the missing data would be expected to experience.

VaR may not be indicative of realized revenue volatility as changes in market conditions or in the composition of the portfolio can have a material impact on the results. In particular, the historical data used for the VaR calculation might indicate higher

or lower levels of portfolio diversification than will be experienced. In order for the VaR model to reflect current market conditions, we update the historical data underlying our VaR model on a weekly basis, or more frequently during periods of market stress, and regularly review the assumptions underlying the model. A minor portion of risks related to our trading positions is not included in VaR. These risks are reviewed as part of our ICAAP. For more information regarding ICAAP, see Capital Management on page 43.

Global Risk Management continually reviews, evaluates and enhances our VaR model so that it reflects the material risks in our trading portfolio. Changes to the VaR model are reviewed and approved prior to implementation and any material changes are reported to management through the appropriate management committees.

Trading limits on quantitative risk measures, including VaR, are independently set by Global Markets Risk Management and reviewed on a regular basis so that trading limits remain relevant and within our overall risk appetite for market risks. Trading limits are reviewed in the context of market liquidity, volatility and strategic business priorities. Trading limits are set at both a granular level to allow for extensive coverage of risks as well as at aggregated portfolios to account for correlations among risk factors. All trading limits are approved at least annually. Approved trading limits are stored and tracked in a centralized limits management system. Trading limit excesses are communicated to management for review. Certain quantitative market risk measures and corresponding limits have been identified as critical in the Corporation’s Risk Appetite Statement. These risk appetite limits are reported on a daily basis and are approved at least annually by the ERC and the Board.

In periods of market stress, *Global Markets* senior leadership communicates daily to discuss losses, key risk positions and any limit excesses. As a result of this process, the businesses may selectively reduce risk.

Table 47 presents the total market-based portfolio VaR which is the combination of the total covered positions (and less liquid trading positions) portfolio and the fair value option portfolio. Covered positions are defined by regulatory standards as trading assets and liabilities, both on- and off-balance sheet, that meet a defined set of specifications. These specifications identify the most liquid trading positions which are intended to be held for a short-term horizon and where we are able to hedge the material risk elements in a two-way market. Positions in less liquid markets, or where there are restrictions on the ability to trade the positions, typically do not qualify as covered positions. Foreign exchange and commodity positions are always considered covered positions, except for structural foreign currency positions that are excluded with prior regulatory approval. In addition, Table 47 presents our fair value option portfolio, which includes substantially all of the funded and unfunded exposures for which we elect the fair value option, and their corresponding hedges. Additionally, market risk VaR for trading activities as presented in Table 47 differs from VaR used for regulatory capital calculations due to the holding period being used. The holding period for VaR used for regulatory capital calculations is 10 days, while for the market risk VaR presented below, it is one day. Both measures utilize the same process and methodology.

The total market-based portfolio VaR results in Table 47 include market risk to which we are exposed from all business segments, excluding credit valuation adjustment (CVA), DVA and related hedges. The majority of this portfolio is within the *Global Markets* segment.

Table 47 presents year-end, average, high and low daily trading VaR for 2018 and 2017 using a 99 percent confidence level. The amounts disclosed in Table 47 and Table 48 align to the view of covered positions used in the Basel 3 capital calculations. Foreign exchange and commodity positions are always considered covered positions, regardless of trading or banking treatment for the trade,

except for structural foreign currency positions that are excluded with prior regulatory approval.

The average total covered positions and less liquid trading positions portfolio VaR decreased during 2018 primarily due to a decrease in credit risk along with an increase in portfolio diversification.

Table 47 Market Risk VaR for Trading Activities

	2018				2017			
(Dollars in millions)	**Year End**	**Average**	**High (1)**	**Low (1)**	Year End	Average	High (1)	Low (1)
Foreign exchange	**$ 9**	**$ 8**	**$ 15**	**$ 2**	$ 7	$ 11	$ 25	$ 3
Interest rate	**36**	**25**	**45**	**15**	22	21	41	11
Credit	**26**	**25**	**31**	**20**	29	26	33	21
Equity	**20**	**20**	**40**	**11**	19	18	33	12
Commodities	**13**	**8**	**15**	**3**	5	5	9	3
Portfolio diversification	**(59)**	**(55)**	**—**	**—**	(49)	(47)	—	—
Total covered positions portfolio	**45**	**31**	**45**	**20**	33	34	53	23
Impact from less liquid exposures	**5**	**3**	**—**	**—**	5	6	—	—
Total covered positions and less liquid trading positions portfolio	**50**	**34**	**51**	**23**	38	40	63	26
Fair value option loans	**8**	**11**	**18**	**8**	9	10	14	7
Fair value option hedges	**5**	**9**	**17**	**4**	7	7	11	4
Fair value option portfolio diversification	**(7)**	**(11)**	**—**	**—**	(7)	(8)	—	—
Total fair value option portfolio	**6**	**9**	**16**	**5**	9	9	11	6
Portfolio diversification	**(3)**	**(5)**	**—**	**—**	(4)	(4)	—	—
Total market-based portfolio	**$ 53**	**$ 38**	**57**	**26**	$ 43	$ 45	69	29

(1) The high and low for each portfolio may have occurred on different trading days than the high and low for the components. Therefore the impact from less liquid exposures and the amount of portfolio diversification, which is the difference between the total portfolio and the sum of the individual components, is not relevant.

The graph below presents the daily covered positions and less liquid trading positions portfolio VaR for 2018, corresponding to the data in Table 47.

Additional VaR statistics produced within our single VaR model are provided in Table 48 at the same level of detail as in Table 47. Evaluating VaR with additional statistics allows for an increased understanding of the risks in the portfolio as the historical market data used in the VaR calculation does not necessarily follow a predefined statistical distribution. Table 48 presents average trading VaR statistics at 99 percent and 95 percent confidence levels for 2018 and 2017.

Table 48 Average Market Risk VaR for Trading Activities – 99 percent and 95 percent VaR Statistics

	2018		2017	
(Dollars in millions)	**99 percent**	**95 percent**	99 percent	95 percent
Foreign exchange	**$ 8**	**$ 5**	$ 11	$ 6
Interest rate	**25**	**16**	21	14
Credit	**25**	**15**	26	15
Equity	**20**	**11**	18	10
Commodities	**8**	**4**	5	3
Portfolio diversification	**(55)**	**(33)**	(47)	(30)
Total covered positions portfolio	**31**	**18**	34	18
Impact from less liquid exposures	**3**	**1**	6	2
Total covered positions and less liquid trading positions portfolio	**34**	**19**	40	20
Fair value option loans	**11**	**6**	10	6
Fair value option hedges	**9**	**6**	7	5
Fair value option portfolio diversification	**(11)**	**(7)**	(8)	(6)
Total fair value option portfolio	**9**	**5**	9	5
Portfolio diversification	**(5)**	**(3)**	(4)	(3)
Total market-based portfolio	**$ 38**	**$ 21**	$ 45	$ 22

Backtesting

The accuracy of the VaR methodology is evaluated by backtesting, which compares the daily VaR results, utilizing a one-day holding period, against a comparable subset of trading revenue. A backtesting excess occurs when a trading loss exceeds the VaR for the corresponding day. These excesses are evaluated to understand the positions and market moves that produced the trading loss with a goal to ensure that the VaR methodology accurately represents those losses. We expect the frequency of trading losses in excess of VaR to be in line with the confidence level of the VaR statistic being tested. For example, with a 99 percent confidence level, we expect one trading loss in excess of VaR every 100 days or between two to three trading losses in excess of VaR over the course of a year. The number of backtesting excesses observed can differ from the statistically expected number of excesses if the current level of market volatility is materially different than the level of market volatility that existed during the three years of historical data used in the VaR calculation.

The trading revenue used for backtesting is defined by regulatory agencies in order to most closely align with the VaR component of the regulatory capital calculation. This revenue differs from total trading-related revenue in that it excludes revenue from trading activities that either do not generate market risk or the market risk cannot be included in VaR. Some examples of the types of revenue excluded for backtesting are fees, commissions, reserves, net interest income and intraday trading revenues.

We conduct daily backtesting on the VaR results used for regulatory capital calculations as well as the VaR results for key legal entities, regions and risk factors. These results are reported to senior market risk management. Senior management regularly reviews and evaluates the results of these tests.

During 2018, there were three days in which there was a backtesting excess for our total covered portfolio VaR, utilizing a one-day holding period.

Total Trading-related Revenue

Total trading-related revenue, excluding brokerage fees, and CVA, DVA and funding valuation adjustment gains (losses), represents the total amount earned from trading positions, including market-based net interest income, which are taken in a diverse range of financial instruments and markets. Trading account assets and liabilities are reported at fair value. For more information on fair value, see *Note 20 – Fair Value Measurements* to the Consolidated Financial Statements. Trading-related revenue can be volatile and is largely driven by general market conditions and customer demand. Also, trading-related revenue is dependent on the volume and type of transactions, the level of risk assumed, and the volatility of price and rate movements at any given time within the ever-changing market environment. Significant daily revenue by business is monitored and the primary drivers of these are reviewed.

The following histogram is a graphic depiction of trading volatility and illustrates the daily level of trading-related revenue for 2018 and 2017. During 2018, positive trading-related revenue was recorded for 98 percent of the trading days, of which 79 percent were daily trading gains of over $25 million. This compares to 2017 where positive trading-related revenue was recorded for 100 percent of the trading days, of which 77 percent were daily trading gains of over $25 million.

Trading Portfolio Stress Testing

Because the very nature of a VaR model suggests results can exceed our estimates and it is dependent on a limited historical window, we also stress test our portfolio using scenario analysis. This analysis estimates the change in the value of our trading portfolio that may result from abnormal market movements.

A set of scenarios, categorized as either historical or hypothetical, are computed daily for the overall trading portfolio and individual businesses. These scenarios include shocks to underlying market risk factors that may be well beyond the shocks found in the historical data used to calculate VaR. Historical scenarios simulate the impact of the market moves that occurred during a period of extended historical market stress. Generally, a multi-week period representing the most severe point during a crisis is selected for each historical scenario. Hypothetical scenarios provide estimated portfolio impacts from potential future market stress events. Scenarios are reviewed and updated in response to changing positions and new economic or political information. In addition, new or ad hoc scenarios are developed to address specific potential market events or particular vulnerabilities in the portfolio. The stress tests are reviewed on a regular basis and the results are presented to senior management.

Stress testing for the trading portfolio is integrated with enterprise-wide stress testing and incorporated into the limits framework. The macroeconomic scenarios used for enterprise-wide stress testing purposes differ from the typical trading portfolio scenarios in that they have a longer time horizon and the results are forecasted over multiple periods for use in consolidated capital and liquidity planning. For more information, see Managing Risk on page 40.

Interest Rate Risk Management for the Banking Book

The following discussion presents net interest income for banking book activities.

Interest rate risk represents the most significant market risk exposure to our banking book balance sheet. Interest rate risk is measured as the potential change in net interest income caused by movements in market interest rates. Client-facing activities, primarily lending and deposit-taking, create interest rate sensitive positions on our balance sheet.

We prepare forward-looking forecasts of net interest income. The baseline forecast takes into consideration expected future business growth, ALM positioning and the direction of interest rate movements as implied by the market-based forward curve. We then measure and evaluate the impact that alternative interest rate scenarios have on the baseline forecast in order to assess interest rate sensitivity under varied conditions. The net interest income forecast is frequently updated for changing assumptions and differing outlooks based on economic trends, market conditions and business strategies. Thus, we continually monitor our balance sheet position in order to maintain an acceptable level of exposure to interest rate changes.

The interest rate scenarios that we analyze incorporate balance sheet assumptions such as loan and deposit growth and pricing, changes in funding mix, product repricing, maturity characteristics and investment securities premium amortization. Our overall goal is to manage interest rate risk so that movements in interest rates do not significantly adversely affect earnings and capital.

Table 49 presents the spot and 12-month forward rates used in our baseline forecasts at December 31, 2018 and 2017.

Table 49 Forward Rates

	December 31, 2018		
	Federal Funds	**Three-month LIBOR**	**10-Year Swap**
Spot rates	**2.50%**	**2.81 %**	**2.71 %**
12-month forward rates	**2.50**	**2.64**	**2.75**
	December 31, 2017		
Spot rates	1.50 %	1.69 %	2.40 %
12-month forward rates	2.00	2.14	2.48

Table 50 shows the pretax impact to forecasted net interest income over the next 12 months from December 31, 2018 and 2017, resulting from instantaneous parallel and non-parallel shocks to the market-based forward curve. Periodically we evaluate the scenarios presented so that they are meaningful in the context of the current rate environment.

During 2018, the asset sensitivity of our balance sheet to rising rates declined primarily due to increases in long-end rates. We continue to be asset sensitive to a parallel move in interest rates with the majority of that impact coming from the short end of the yield curve. Additionally, higher interest rates impact the fair value of debt securities and, accordingly, for debt securities classified as AFS, may adversely affect accumulated OCI and thus capital levels under the Basel 3 capital rules. Under instantaneous upward parallel shifts, the near-term adverse impact to Basel 3 capital is reduced over time by offsetting positive impacts to net interest income. For more information on Basel 3, see Capital Management – Regulatory Capital on page 44.

Table 50 Estimated Banking Book Net Interest Income Sensitivity to Curve Changes

(Dollars in millions)	Short Rate (bps)	Long Rate (bps)	December 31 2018	2017
Parallel Shifts				
+100 bps instantaneous shift	+100	+100	**$ 2,651**	$ 3,317
-100 bps instantaneous shift	-100	-100	**(4,109)**	(5,183)
Flatteners				
Short-end instantaneous change	+100	—	**1,977**	2,182
Long-end instantaneous change	—	-100	**(1,616)**	(2,765)
Steepeners				
Short-end instantaneous change	-100	—	**(2,478)**	(2,394)
Long-end instantaneous change	—	+100	**673**	1,135

The sensitivity analysis in Table 50 assumes that we take no action in response to these rate shocks and does not assume any change in other macroeconomic variables normally correlated with changes in interest rates. As part of our ALM activities, we use securities, certain residential mortgages, and interest rate and foreign exchange derivatives in managing interest rate sensitivity.

The behavior of our deposit portfolio in the baseline forecast and in alternate interest rate scenarios is a key assumption in our projected estimates of net interest income. The sensitivity analysis in Table 50 assumes no change in deposit portfolio size or mix from the baseline forecast in alternate rate environments. In higher rate scenarios, any customer activity resulting in the replacement of low-cost or noninterest-bearing deposits with higher yielding deposits or market-based funding would reduce our benefit in those scenarios.

Interest Rate and Foreign Exchange Derivative Contracts

Interest rate and foreign exchange derivative contracts are utilized in our ALM activities and serve as an efficient tool to manage our interest rate and foreign exchange risk. We use derivatives to hedge the variability in cash flows or changes in fair value on our balance sheet due to interest rate and foreign exchange components. For more information on our hedging activities, see *Note 3 – Derivatives* to the Consolidated Financial Statements.

Our interest rate contracts are generally non-leveraged generic interest rate and foreign exchange basis swaps, options, futures and forwards. In addition, we use foreign exchange contracts, including cross-currency interest rate swaps, foreign currency futures contracts, foreign currency forward contracts and options to mitigate the foreign exchange risk associated with foreign currency-denominated assets and liabilities.

Changes to the composition of our derivatives portfolio during 2018 reflect actions taken for interest rate and foreign exchange rate risk management. The decisions to reposition our derivatives portfolio are based on the current assessment of economic and financial conditions including the interest rate and foreign currency environments, balance sheet composition and trends, and the relative mix of our cash and derivative positions. We use interest rate derivative instruments to hedge the variability in the cash flows of our assets and liabilities and other forecasted transactions (collectively referred to as cash flow hedges). The net losses on both open and terminated cash flow hedge derivative instruments recorded in accumulated OCI were $1.3 billion, on a pretax basis, at both December 31, 2018 and 2017. These net losses are expected to be reclassified into earnings in the same period as the hedged cash flows affect earnings and will decrease income or increase expense on the respective hedged cash flows. Assuming no change in open cash flow derivative hedge positions and no changes in prices or interest rates beyond what is implied in forward yield curves at December 31, 2018, the pretax net losses are expected to be reclassified into earnings as follows: 25 percent within the next year, 56 percent in years two through five and 11 percent in years six through 10, with the remaining eight percent thereafter. For more information on derivatives designated as cash flow hedges, see *Note 3 – Derivatives* to the Consolidated Financial Statements.

We hedge our net investment in non-U.S. operations determined to have functional currencies other than the U.S. dollar using forward foreign exchange contracts that typically settle in less than 180 days, cross-currency basis swaps and foreign exchange options. We recorded net after-tax losses on derivatives in accumulated OCI associated with net investment hedges which were offset by gains on our net investments in consolidated non-U.S. entities at December 31, 2018.

Table 51 presents derivatives utilized in our ALM activities and shows the notional amount, fair value, weighted-average receive-fixed and pay-fixed rates, expected maturity and average estimated durations of our open ALM derivatives at December 31, 2018 and 2017. These amounts do not include derivative hedges on our MSRs.

Table 51 Asset and Liability Management Interest Rate and Foreign Exchange Contracts

		December 31, 2018							
		Expected Maturity							
(Dollars in millions, average estimated duration in years)	Fair Value	Total	2019	2020	2021	2022	2023	Thereafter	Average Estimated Duration
Receive-fixed interest rate swaps (1)	$2,128								5.17
Notional amount		$198,914	$27,176	$16,347	$14,640	$19,866	$36,215	$84,670	
Weighted-average fixed-rate		2.66 %	1.87 %	2.68 %	3.17 %	2.56 %	2.37 %	2.97 %	
Pay-fixed interest rate swaps (1)	295								6.30
Notional amount		$49,275	$1,210	$4,344	$1,616	$—	$10,801	$31,304	
Weighted-average fixed-rate		2.50 %	2.07 %	2.16 %	2.22 %	— %	2.59 %	2.55 %	

Same-currency basis swaps [2]	**21**							
Notional amount		**$ 101,203**	**$ 7,628**	**$ 15,097**	**$ 15,493**	**$ 2,586**	**$ 2,017**	**$ 58,382**
Foreign exchange basis swaps [1, 3, 4]	**(1,716)**							
Notional amount		**106,742**	**13,946**	**21,448**	**19,241**	**10,239**	**6,260**	**35,608**
Option products	2							
Notional amount		**587**	**572**	**—**	**—**	**—**	**15**	**—**
Foreign exchange contracts [1, 4, 5]	**82**							
Notional amount [6]		**(8,447)**	**(27,823)**	**13**	**4,196**	**2,741**	**2,448**	**9,978**
Net ALM contracts	**$ 812**							

For footnotes, see page 76.

Table 51 Asset and Liability Management Interest Rate and Foreign Exchange Contracts (continued)

		December 31, 2017							
		Expected Maturity							
(Dollars in millions, average estimated duration in years)	Fair Value	Total	2018	2019	2020	2021	2022	Thereafter	Average Estimated Duration
Receive-fixed interest rate swaps (1)	$2,330								5.38
Notional amount		$176,390	$21,850	$27,176	$16,347	$6,498	$19,120	$85,399	
Weighted-average fixed-rate		2.42 %	3.20 %	1.87 %	1.88 %	2.99 %	2.10 %	2.52 %	
Pay-fixed interest rate swaps (1)	(37)								5.63
Notional amount		$45,873	$11,555	$1,210	$4,344	$1,616	$—	$27,148	
Weighted-average fixed-rate		2.15 %	1.73 %	2.07 %	2.16 %	2.22 %	— %	2.32 %	
Same-currency basis swaps (2)	(17)								
Notional amount		$38,622	$11,028	$6,789	$1,180	$2,807	$955	$15,863	
Foreign exchange basis swaps (1, 3, 4)	(1,616)								
Notional amount		107,263	24,886	11,922	13,367	9,301	6,860	40,927	
Option products	13								
Notional amount		1,218	1,201	—	—	—	—	17	
Foreign exchange contracts (1, 4, 5)	1,424								
Notional amount (6)		(11,783)	(28,689)	2,231	(24)	2,471	2,919	9,309	
Net ALM contracts	$2,097								

(1) Does not include basis adjustments on either fixed-rate debt issued by the Corporation or AFS debt securities, which are hedged using derivatives designated as fair value hedging instruments, that substantially offset the fair values of these derivatives.

(2) At December 31, 2018 and 2017, the notional amount of same-currency basis swaps included $101.2 billion and $38.6 billion in both foreign currency and U.S. dollar-denominated basis swaps in which both sides of the swap are in the same currency.

(3) Foreign exchange basis swaps consisted of cross-currency variable interest rate swaps used separately or in conjunction with receive-fixed interest rate swaps.

(4) Does not include foreign currency translation adjustments on certain non-U.S. debt issued by the Corporation that substantially offset the fair values of these derivatives.

(5) The notional amount of foreign exchange contracts of $(8.4) billion at December 31, 2018 was comprised of $25.2 billion in foreign currency-denominated and cross-currency receive-fixed swaps, $(32.7) billion in net foreign currency forward rate contracts, $(1.8) billion in foreign currency-denominated pay-fixed swaps and $814 million in net foreign currency futures contracts. Foreign exchange contracts of $(11.8) billion at December 31, 2017 were comprised of $29.1 billion in foreign currency-denominated and cross-currency receive-fixed swaps, $(35.6) billion in net foreign currency forward rate contracts, $(6.2) billion in foreign currency-denominated pay-fixed swaps and $940 million in foreign currency futures contracts.

(6) Reflects the net of long and short positions. Amounts shown as negative reflect a net short position.

Mortgage Banking Risk Management

We originate, fund and service mortgage loans, which subject us to credit, liquidity and interest rate risks, among others. We determine whether loans will be held for investment or held for sale at the time of commitment and manage credit and liquidity risks by selling or securitizing a portion of the loans we originate.

Interest rate risk and market risk can be substantial in the mortgage business. Changes in interest rates and other market factors impact the volume of mortgage originations. Changes in interest rates also impact the value of interest rate lock commitments (IRLCs) and the related residential first mortgage LHFS between the date of the IRLC and the date the loans are sold to the secondary market. An increase in mortgage interest rates typically leads to a decrease in the value of these instruments. Conversely, when there is an increase in interest rates, the value of the MSRs will increase driven by lower prepayment expectations. Because the interest rate risks of these two hedged items offset, we combine them into one overall hedged item with one combined economic hedge portfolio consisting of derivative contracts and securities.

During 2018 and 2017, we recorded gains of $244 million and $118 million related to the change in fair value of the MSRs, IRLCs and LHFS, net of gains and losses on the hedge portfolio. For more information on MSRs, see *Note 20 – Fair Value Measurements* to the Consolidated Financial Statements.

Compliance and Operational Risk Management

Compliance risk is the risk of legal or regulatory sanctions, material financial loss or damage to the reputation of the Corporation arising from the failure of the Corporation to comply with the requirements of applicable laws, rules, regulations and our internal policies and procedures (collectively, applicable laws, rules and regulations).

Operational risk is the risk of loss resulting from inadequate or failed processes, people and systems or from external events. Operational risk may occur anywhere in the Corporation, including third-party business processes, and is not limited to operations functions. Effects may extend beyond financial losses and may result in reputational risk impacts. Operational risk includes legal risk. Additionally, operational risk is a component in the calculation of total risk-weighted assets used in the Basel 3 capital calculation. For more information on Basel 3 calculations, see Capital Management on page 43.

FLUs and control functions are first and foremost responsible for managing all aspects of their businesses, including their compliance and operational risk. FLUs and control functions are required to understand their business processes and related risks and controls, including the related regulatory requirements, and monitor and report on the effectiveness of the control environment. In order to actively monitor and assess the performance of their processes and controls, they must conduct comprehensive quality assurance activities and identify issues and risks to remediate control gaps and weaknesses. FLUs and control functions must also adhere to compliance and operational risk appetite limits to meet strategic, capital and financial planning objectives. Finally, FLUs and control functions are responsible for the proactive identification, management and escalation of compliance and operational risks across the Corporation.

Global Compliance and Operational Risk teams independently assess compliance and operational risk, monitor business activities and processes, evaluate FLUs and control functions for adherence to applicable laws, rules and regulations, including identifying issues and risks, determining and developing tests to be conducted by the Enterprise Independent Testing unit, and reporting on the state of the control environment. Enterprise Independent Testing, an independent testing function within IRM, works with Global Compliance and Operational Risk, the FLUs and control functions in the identification of testing needs and test design, and is accountable for test execution, reporting and analysis of results.

The Corporation's approach to the management of compliance risk is described in the Global Compliance - Enterprise Policy, which outlines the requirements of the Corporation's compliance risk management program, and defines roles and responsibilities of FLUs, IRM and Corporate Audit, the three lines of defense in managing compliance risk. The requirements work together to drive a comprehensive risk-based approach for the proactive identification, management and escalation of compliance risks throughout the Corporation. For more information on FLUs and control functions, see Managing Risk on page 40.

The Corporation's approach to operational risk management is outlined in the Operational Risk Management - Enterprise Policy which establishes the requirements of the Corporation's operational risk management program and specifies the responsibilities and accountabilities of the first and second lines of defense for managing operational risk so that our business processes are designed and executed effectively.

The Global Compliance Enterprise Policy and Operational Risk Management - Enterprise Policy also set the requirements for reporting compliance and operational risk information to executive management as well as the Board or appropriate Board-level committees in support of Global Compliance and Operational Risk's responsibilities for conducting independent oversight of our compliance and operational risk management activities. The Board provides oversight of compliance risk through its Audit Committee and the ERC, and operational risk through the ERC.

A key operational risk facing the Corporation is information security, which includes cybersecurity. Cybersecurity risk represents, among other things, exposure to failures or interruptions of service or breaches of security, resulting from malicious technological attacks or otherwise, that impact the confidentiality, availability or integrity of our operations, systems or data, including sensitive corporate and customer information. The Corporation manages information security risk in accordance with internal policies which govern our comprehensive information security program designed to protect the Corporation by enabling preventative and detective measures to combat information and cybersecurity risks. The Board and the ERC provide cybersecurity and information security risk oversight for the Corporation and our Global Information Security Team manages the day-to-day implementation of our information security program.

Reputational Risk Management

Reputational risk is the risk that negative perceptions of the Corporation's conduct or business practices may adversely impact its profitability or operations. Reputational risk may result from many of the Corporation's activities, including those related to the management of our strategic, operational, compliance and credit risks.

The Corporation manages reputational risk through established policies and controls in its businesses and risk management processes to mitigate reputational risks in a timely manner and through proactive monitoring and identification of potential reputational risk events. If reputational risk events occur, we focus on remediating the underlying issue and taking action to minimize damage to the Corporation's reputation. The Corporation has processes and procedures in place to respond to events that give rise to reputational risk, including educating individuals and organizations that influence public opinion, implementing external communication strategies to mitigate the risk, and informing key stakeholders of potential reputational risks.

The Corporation's organization and governance structure provides oversight of reputational risks, and reputational risk reporting is provided regularly and directly to management and the ERC, which provides primary oversight of reputational risk. In addition, each FLU has a committee, which includes representatives from Compliance, Legal and Risk, that is responsible for the oversight of reputational risk. Such committees' oversight includes providing approval for business activities that present elevated levels of reputational risks.

Complex Accounting Estimates

Our significant accounting principles, as described in *Note 1 – Summary of Significant Accounting Principles* to the Consolidated Financial Statements, are essential in understanding the Management's Discussion and Analysis of Financial Condition and Results of Operations (MD&A). Many of our significant accounting principles require complex judgments to estimate the values of assets and liabilities. We have procedures and processes in place to facilitate making these judgments.

The more judgmental estimates are summarized in the following discussion. We have identified and described the development of the variables most important in the estimation processes that involve mathematical models to derive the estimates. In many cases, there are numerous alternative judgments that could be used in the process of determining the inputs to the models. Where alternatives exist, we have used the factors that we believe represent the most reasonable value in developing the inputs. Actual performance that differs from our estimates of the key variables could materially impact our results of operations. Separate from the possible future impact to our results of operations from input and model variables, the value of our lending portfolio and market-sensitive assets and liabilities may change subsequent to the balance sheet date, often significantly, due to the nature and magnitude of future credit and market conditions. Such credit and market conditions may change quickly and in unforeseen ways and the resulting volatility could have a significant, negative effect on future operating results. These fluctuations would not be indicative of deficiencies in our models or inputs.

Allowance for Credit Losses

The allowance for credit losses, which includes the allowance for loan and lease losses and the reserve for unfunded lending commitments, represents management's estimate of probable incurred credit losses in the Corporation's loan and lease portfolio excluding those loans accounted for under the fair value option. The allowance for credit losses includes both quantitative and qualitative components. The qualitative component has a higher degree of management subjectivity, and includes factors such as concentrations, economic conditions and other considerations. Our process for determining the allowance for credit losses is discussed in *Note 1 – Summary of Significant Accounting Principles* to the Consolidated Financial Statements.

Our estimate for the allowance for loan and lease losses is sensitive to the loss rates and expected cash flows from our Consumer Real Estate and Credit Card and Other Consumer portfolio segments, as well as our U.S. small business commercial card portfolio within the Commercial portfolio segment. For each one-percent increase in the loss rates on loans collectively evaluated for impairment in our Consumer Real Estate portfolio segment, excluding PCI loans, coupled with a one-percent decrease in the discounted cash flows on those loans individually evaluated for impairment within this portfolio segment, the allowance for loan and lease losses at December 31, 2018 would have increased $24 million. We subject our PCI portfolio to stress scenarios to evaluate the potential impact given certain events. A one-percent decrease in the expected cash flows would result in a $41 million impairment of the portfolio. Within our Credit Card and Other Consumer portfolio segment and U.S. small business commercial card portfolio, for each one-percent increase in the loss rates on loans collectively evaluated for impairment coupled with a one-percent decrease in the expected cash flows on those loans individually evaluated for impairment, the allowance for loan and lease losses at December 31, 2018 would have increased $44 million.

Our allowance for loan and lease losses is sensitive to the risk ratings assigned to loans and leases within the Commercial portfolio segment (excluding the U.S. small business commercial card portfolio). Assuming a downgrade of one level in the internal risk ratings for commercial loans and leases, except loans and leases already classified as Substandard and Doubtful as defined by regulatory authorities, the allowance for loan and lease losses would have increased $2.5 billion at December 31, 2018.

The allowance for loan and lease losses as a percentage of total loans and leases at December 31, 2018 was 1.02 percent and these hypothetical increases in the allowance would raise the ratio to 1.30 percent.

These sensitivity analyses do not represent management’s expectations of the deterioration in risk ratings or the increases in loss rates but are provided as hypothetical scenarios to assess the sensitivity of the allowance for loan and lease losses to changes in key inputs. We believe the risk ratings and loss severities currently in use are appropriate and that the probability of the alternative scenarios outlined above occurring within a short period of time is remote.

The process of determining the level of the allowance for credit losses requires a high degree of judgment. It is possible that others, given the same information, may at any point in time reach different reasonable conclusions.

Fair Value of Financial Instruments

Under applicable accounting standards, we are required to maximize the use of observable inputs and minimize the use of unobservable inputs in measuring fair value. We classify fair value measurements of financial instruments and MSRs based on the three-level fair value hierarchy in the accounting standards.

The fair values of assets and liabilities may include adjustments, such as market liquidity and credit quality, where appropriate. Valuations of products using models or other techniques are sensitive to assumptions used for the significant inputs. Where market data is available, the inputs used for valuation reflect that information as of our valuation date. Inputs to valuation models are considered unobservable if they are supported by little or no market activity. In periods of extreme volatility, lessened liquidity or in illiquid markets, there may be more variability in market pricing or a lack of market data to use in the valuation process. In keeping with the prudent application of estimates and management judgment in determining the fair value of assets and liabilities, we have in place various processes and controls that include: a model validation policy that requires review and approval of quantitative models used for deal pricing, financial statement fair value determination and risk quantification; a trading product valuation policy that requires verification of all traded product valuations; and a periodic review and substantiation of daily profit and loss reporting for all traded products. Primarily through validation controls, we utilize both broker and pricing service inputs which can and do include both market-observable and internally-modeled values and/or valuation inputs. Our reliance on this information is affected by our understanding of how the broker and/or pricing service develops

its data with a higher degree of reliance applied to those that are more directly observable and lesser reliance applied to those developed through their own internal modeling. For example, broker quotes in less active markets may only be indicative and therefore less reliable. These processes and controls are performed independently of the business. For additional information, see *Note 20 – Fair Value Measurements* and *Note 21 – Fair Value Option* to the Consolidated Financial Statements.

Level 3 Assets and Liabilities

Financial assets and liabilities, and MSRs, where values are based on valuation techniques that require inputs that are both unobservable and are significant to the overall fair value measurement are classified as Level 3 under the fair value hierarchy established in applicable accounting standards. The fair value of these Level 3 financial assets and liabilities and MSRs is determined using pricing models, discounted cash flow methodologies or similar techniques for which the determination of fair value requires significant management judgment or estimation. Level 3 financial instruments may be hedged with derivatives classified as Level 1 or 2; therefore, gains or losses associated with Level 3 financial instruments may be offset by gains or losses associated with financial instruments classified in other levels of the fair value hierarchy. The Level 3 gains and losses recorded in earnings did not have a significant impact on our liquidity or capital. We conduct a review of our fair value hierarchy classifications on a quarterly basis. Transfers into or out of Level 3 are made if the significant inputs used in the financial models measuring the fair values of the assets and liabilities became unobservable or observable, respectively, in the current marketplace. For more information on transfers into and out of Level 3 during 2018, 2017 and 2016, see *Note 20 – Fair Value Measurements* to the Consolidated Financial Statements.

Accrued Income Taxes and Deferred Tax Assets

Accrued income taxes, reported as a component of either other assets or accrued expenses and other liabilities on the Consolidated Balance Sheet, represent the net amount of current income taxes we expect to pay to or receive from various taxing jurisdictions attributable to our operations to date. We currently file income tax returns in more than 100 jurisdictions and consider many factors, including statutory, judicial and regulatory guidance, in estimating the appropriate accrued income taxes for each jurisdiction.

Net deferred tax assets, reported as a component of other assets on the Consolidated Balance Sheet, represent the net decrease in taxes expected to be paid in the future because of net operating loss (NOL) and tax credit carryforwards and because of future reversals of temporary differences in the bases of assets and liabilities as measured by tax laws and their bases as reported in the financial statements. NOL and tax credit carryforwards result in reductions to future tax liabilities, and many of these attributes can expire if not utilized within certain periods. We consider the need for valuation allowances to reduce net deferred tax assets to the amounts that we estimate are more likely than not to be realized.

Consistent with the applicable accounting guidance, we monitor relevant tax authorities and change our estimates of accrued income taxes and/or net deferred tax assets due to changes in income tax laws and their interpretation by the courts and regulatory authorities. These revisions of our estimates, which also may result from our income tax planning and from the resolution of income tax audit matters, may be material to our operating results for any given period.

See *Note 19 – Income Taxes* to the Consolidated Financial Statements for a table of significant tax attributes and additional information. For more information, see page 13 under Item 1A. Risk Factors – Regulatory, Compliance and Legal.

Goodwill and Intangible Assets

The nature of and accounting for goodwill and intangible assets are discussed in *Note 1 – Summary of Significant Accounting Principles*, and *Note 8 – Goodwill and Intangible Assets*. Beginning with our annual goodwill impairment test as of June 30, 2018, we conducted a qualitative assessment, rather than a quantitative assessment as previously performed, that is more fully described in *Note 1 – Summary of Significant Accounting Principles* to the Consolidated Financial Statements.

We completed our annual goodwill impairment test as of June 30, 2018 for all of our reporting units that had goodwill. We performed that test by assessing qualitative factors to determine whether it is more likely than not that the fair value of each reporting unit is less than its respective carrying value. Factors considered in the qualitative assessments include, among other things, macroeconomic conditions, industry and market considerations, financial performance of the respective reporting unit and other relevant entity- and reporting-unit specific considerations. If based on the results of the qualitative assessment, it is more likely than not that the fair value of a reporting unit is less than its carrying value, a quantitative assessment is performed.

Based on our qualitative assessments, we determined that for each reporting unit with goodwill, it was more likely than not that its respective fair value exceeded its carrying value, indicating there was no impairment. For more information regarding goodwill balances at June 30, 2018, see *Note 8 – Goodwill and Intangible Assets* to the Consolidated Financial Statements.

Representations and Warranties Liability

The methodology used to estimate the liability for obligations under representations and warranties related to transfers of residential mortgage loans is a function of the type of representations and warranties provided in the sales contracts and considers a variety of factors. These factors, which incorporate judgment, are subject to change based on our specific experience. Our experience in negotiating settlements with trustees and other counterparties is an important input in determining our estimate of the liability. We also consider actual defaults, estimated future defaults, historical loss experience, estimated home prices and other economic conditions. Changes to any one of these factors could impact the estimate of our liability.

The representations and warranties provision may vary significantly each period as the methodology used to estimate the expense continues to be refined. The estimate of the liability for representations and warranties is sensitive to future defaults, loss severity and the net repurchase rate. An assumed simultaneous increase or decrease of 10 percent in estimated future defaults, loss severity and the net repurchase rate would result in an increase or decrease of approximately $200 million in the representations and warranties liability as of December 31, 2018. These sensitivities are hypothetical and are intended to provide an indication of the impact of a significant change in these key assumptions on the representations and warranties liability. In reality, changes in one assumption may result in changes in other assumptions, which may or may not counteract the sensitivity.

For more information on representations and warranties exposure, see *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements.

2017 Compared to 2016

The following discussion and analysis provide a comparison of our results of operations for 2017 and 2016. This discussion should be read in conjunction with the Consolidated Financial Statements and related Notes.

Overview

Net Income

Net income was $18.2 billion, or $1.56 per diluted share in 2017 compared to $17.8 billion, or $1.49 per diluted share in 2016. The results for 2017 included a charge of $2.9 billion related to the Tax Act. The pretax results for 2017 compared to 2016 were driven by higher revenue, largely the result of an increase in net interest income, lower provision for credit losses and a decline in noninterest expense.

Net Interest Income

Net interest income increased $3.6 billion to $44.7 billion in 2017 compared to 2016. Net interest yield on an FTE basis increased 12 bps to 2.37 percent for 2017. These increases were primarily driven by the benefits from higher interest rates and loan and deposit growth, partially offset by the sale of the non-U.S. consumer credit card business in the second quarter of 2017.

Noninterest Income

Noninterest income increased $80 million to $42.7 billion in 2017 compared to 2016. The following highlights the significant changes.

- Service charges increased $180 million primarily driven by the impact of pricing strategies and higher treasury services related revenue.
- Investment and brokerage services income increased $487 million primarily driven by the impact of AUM flows and higher market valuations, partially offset by the impact of changing market dynamics on transactional revenue and AUM pricing.
- Investment banking income increased $770 million primarily due to higher advisory fees and higher debt and equity issuance fees.
- Trading account profits increased $375 million primarily due to increased client financing activity in equities, partially offset by weaker performance across most fixed-income products.
- Other income decreased $1.8 billion primarily due to lower mortgage banking income, with declines in both MSR results and production. Included in 2017 was a $793 million pretax gain recognized in connection with the sale of the non-U.S. consumer credit card business and a downward valuation adjustment of $946 million on tax-advantaged energy investments in connection with the Tax Act.

Provision for Credit Losses

The provision for credit losses decreased $201 million to $3.4 billion for 2017 compared to 2016 primarily due to reductions in energy exposures in the commercial portfolio and credit quality improvements in the consumer real estate portfolio. This was partially offset by portfolio seasoning and loan growth in the U.S. credit card portfolio and a single-name non-U.S. commercial charge-off.

Noninterest Expense

Noninterest expense decreased $340 million to $54.7 billion for 2017 compared to 2016. The decrease was primarily due to lower operating costs, a reduction from the sale of the non-U.S. consumer credit card business and lower litigation expense, partially offset by a $316 million impairment charge related to certain data centers that were in the process of being sold and

$145 million for the shared success discretionary year-end bonus awarded to certain employees.

Income Tax Expense

Tax expense for 2017 included a charge of $1.9 billion reflecting the impact of the Tax Act. Other than the impact of the Tax Act, the effective tax rate for 2017 was driven by our recurring tax preference benefits as well as an expense recognized in connection with the sale of the non-U.S. consumer credit card business, largely offset by benefits related to the adoption of the new accounting standard for the tax impact associated with share-based compensation, and the restructuring of certain subsidiaries. The effective tax rate for 2016 was driven by our recurring tax preferences and net tax benefits related to various tax audit matters, partially offset by a charge for the impact of U.K. tax law changes enacted in 2016.

Business Segment Operations

Consumer Banking

Net income for *Consumer Banking* increased $1.0 billion to $8.2 billion in 2017 compared to 2016 primarily driven by higher net interest income, partially offset by higher provision for credit losses and lower mortgage banking income which is included in other noninterest income. Net interest income increased $3.0 billion to $24.3 billion primarily due to the beneficial impact of an increase in investable assets as a result of higher deposits, as well as pricing discipline and loan growth. Noninterest income decreased $227 million to $10.2 billion driven by lower mortgage banking income, partially offset by higher card income and service charges. The provision for credit losses increased $810 million to $3.5 billion due to portfolio seasoning and loan growth in the U.S. credit card portfolio. Noninterest expense increased $131 million to $17.8 billion driven by higher personnel expense, including the shared success discretionary year-end bonus, and increased FDIC expense, as well as investments in digital capabilities and business growth. These increases were partially offset by improved operating efficiencies.

Global Wealth & Investment Management

Net income for *GWIM* increased $312 million to $3.1 billion in 2017 compared to 2016 due to higher revenue, partially offset by an increase in noninterest expense. Net interest income increased $414 million to $6.2 billion driven by higher short-term interest rates. Noninterest income, which primarily includes investment and brokerage services income, increased $526 million to $12.4 billion. The increase in noninterest income was driven by the impact of AUM flows and higher market valuations, partially offset by the impact of changing market dynamics on transactional revenue and AUM pricing. Noninterest expense increased $390 million to $13.6 billion primarily driven by higher revenue-related incentive costs.

Global Banking

Net income for *Global Banking* increased $1.2 billion to $7.0 billion in 2017 compared to 2016 driven by higher revenue and lower

provision for credit losses. Revenue increased $1.6 billion to $20.0 billion driven by higher net interest income and noninterest income. Net interest income increased $1.0 billion to $10.5 billion due to loan and deposit-related growth, higher short-term rates on an increased deposit base and the impact of the allocation of ALM activities, partially offset by credit spread compression. Noninterest income increased $521 million to $9.5 billion largely due to higher investment banking fees. The provision for credit losses decreased $671 million to $212 million in 2017 primarily driven by reductions in energy exposures and continued portfolio improvement, partially offset by *Global Banking's* portion of a 2017 single-name non-U.S. commercial charge-off. Noninterest expense increased $110 million to $8.6 billion in 2017 primarily driven by higher investments in technology and higher deposit insurance, partially offset by lower litigation costs.

Global Markets

Net income for *Global Markets* decreased $524 million to $3.3 billion in 2017 compared to 2016. Net DVA losses were $428 million compared to losses of $238 million in 2016. Excluding net DVA, net income decreased $405 million to $3.6 billion primarily driven by higher noninterest expense, lower sales and trading revenue and an increase in the provision for credit losses, partially offset by higher investment banking fees. Sales and trading revenue, excluding net DVA, decreased $423 million primarily due to weaker performance in rates products and emerging markets. The provision for credit losses increased $133 million to $164 million in 2017, reflecting *Global Markets'* portion of a single-name non-U.S. commercial charge-off. Noninterest expense increased $560 million to $10.7 billion primarily due to higher litigation expense and continued investments in technology.

All Other

The net loss for *All Other* increased $1.6 billion to a net loss of $3.3 billion, driven by a charge of $2.9 billion due to enactment of the Tax Act. The pretax loss for 2017 compared to 2016 decreased $523 million reflecting lower noninterest expense and a larger benefit in the provision for credit losses, partially offset by a decline in revenue. Revenue declined $1.5 billion primarily due to lower mortgage banking income. All other noninterest loss decreased marginally and included a pretax gain of $793 million on the sale of the non-U.S. credit card business and a downward valuation adjustment of $946 million on tax-advantaged energy investments in connection with the Tax Act.

The benefit in the provision for credit losses increased $461 million to a benefit of $561 million primarily driven by continued runoff of the non-core portfolio, loan sale recoveries and the sale of the non-U.S. consumer credit card business.

Noninterest expense decreased $1.5 billion to $4.1 billion driven by lower litigation expense, lower personnel expense and a decline in non-core mortgage servicing costs.

The income tax benefit was $1.0 billion in 2017 compared to a benefit of $3.1 billion in 2016. The decrease in the tax benefit was driven by the impacts of the Tax Act. Both periods include income tax benefit adjustments to eliminate the FTE treatment of certain tax credits recorded in *Global Banking*.

Statistical Tables

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Table I Outstanding Loans and Leases

	December 31				
(Dollars in millions)	**2018**	2017	2016	2015	2014
Consumer					
Residential mortgage	**$ 208,557**	$ 203,811	$ 191,797	$ 187,911	$ 216,197
Home equity	**48,286**	57,744	66,443	75,948	85,725
U.S. credit card	**98,338**	96,285	92,278	89,602	91,879
Non-U.S. credit card	**—**	—	9,214	9,975	10,465
Direct/Indirect consumer (1)	**91,166**	96,342	95,962	90,149	81,386
Other consumer (2)	**202**	166	626	713	841
Total consumer loans excluding loans accounted for under the fair value option	**446,549**	454,348	456,320	454,298	486,493
Consumer loans accounted for under the fair value option (3)	**682**	928	1,051	1,871	2,077
Total consumer	**447,231**	455,276	457,371	456,169	488,570
Commercial					
U.S. commercial	**299,277**	284,836	270,372	252,771	220,293
Non-U.S. commercial	**98,776**	97,792	89,397	91,549	80,083
Commercial real estate (4)	**60,845**	58,298	57,355	57,199	47,682
Commercial lease financing	**22,534**	22,116	22,375	21,352	19,579
	481,432	463,042	439,499	422,871	367,637
	14,565	13,649	12,993	12,876	13,293

U.S. small business commercial (5)					
Total commercial loans excluding loans accounted for under the fair value option	**495,997**	476,691	452,492	435,747	380,930
Commercial loans accounted for under the fair value option (3)	**3,667**	4,782	6,034	5,067	6,604
Total commercial	**499,664**	481,473	458,526	440,814	387,534
Less: Loans of business held for sale (6)	**—**	—	(9,214)	—	—
Total loans and leases	**$946,895**	$936,749	$906,683	$896,983	$876,104

(1) Includes auto and specialty lending loans and leases of $50.1 billion, $52.4 billion, $50.7 billion, $43.9 billion and $38.7 billion, unsecured consumer lending loans of $383 million, $469 million, $585 million, $886 million and $1.5 billion, U.S. securities-based lending loans of $37.0 billion, $39.8 billion, $40.1 billion, $39.8 billion and $35.8 billion, non-U.S. consumer loans of $2.9 billion, $3.0 billion, $3.0 billion, $3.9 billion and $4.0 billion, student loans of $0, $0, $497 million, $564 million and $632 million, and other consumer loans of $746 million, $684 million, $1.1 billion, $1.0 billion and $761 million at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.

(2) Substantially all of other consumer at December 31, 2018 and 2017 is consumer overdrafts. Other consumer at December 31, 2016, 2015 and 2014 also includes consumer finance loans of $465 million, $564 million and $676 million, respectively.

(3) Consumer loans accounted for under the fair value option were residential mortgage loans of $336 million, $567 million, $710 million, $1.6 billion and $1.9 billion, and home equity loans of $346 million, $361 million, $341 million, $250 million and $196 million at December 31, 2018, 2017, 2016, 2015 and 2014, respectively. Commercial loans accounted for under the fair value option were U.S. commercial loans of $2.5 billion, $2.6 billion, $2.9 billion, $2.3 billion and $1.9 billion, and non-U.S. commercial loans of $1.1 billion, $2.2 billion, $3.1 billion, $2.8 billion and $4.7 billion at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.

(4) Includes U.S. commercial real estate loans of $56.6 billion, $54.8 billion, $54.3 billion, $53.6 billion and $45.2 billion, and non-U.S. commercial real estate loans of $4.2 billion, $3.5 billion, $3.1 billion, $3.5 billion and $2.5 billion at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.

(5) Includes card-related products.

(6) Represents non-U.S. credit card loans, which were included in assets of business held for sale on the Consolidated Balance Sheet.

Table II Nonperforming Loans, Leases and Foreclosed Properties [1]

(Dollars in millions)	December 31 2018	2017	2016	2015	2014
Consumer					
Residential mortgage	**$1,893**	$2,476	$3,056	$4,803	$6,889
Home equity	**1,893**	2,644	2,918	3,337	3,901
Direct/Indirect consumer	**56**	46	28	24	28
Other consumer	**—**	—	2	1	1
Total consumer [2]	**3,842**	5,166	6,004	8,165	10,819
Commercial					
U.S. commercial	**794**	814	1,256	867	701
Non-U.S. commercial	**80**	299	279	158	1
Commercial real estate	**156**	112	72	93	321
Commercial lease financing	**18**	24	36	12	3
	1,048	1,249	1,643	1,130	1,026
U.S. small business commercial	**54**	55	60	82	87
Total commercial [3]	**1,102**	1,304	1,703	1,212	1,113
Total nonperforming loans and leases	**4,944**	6,470	7,707	9,377	11,932
Foreclosed properties	**300**	288	377	459	697
Total nonperforming loans, leases and foreclosed properties	**$5,244**	$6,758	$8,084	$9,836	$12,629

(1) Balances do not include PCI loans even though the customer may be contractually past due. PCI loans were recorded at fair value upon acquisition and accrete interest income over the remaining life of the loan. In addition, balances do not include foreclosed properties insured by certain government-guaranteed loans, principally FHA-insured loans, that entered foreclosure of $488 million, $801 million, $1.2 billion, $1.4 billion and $1.1 billion at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.

(2) In 2018, $625 million in interest income was estimated to be contractually due on $3.8 billion of consumer loans and leases classified as nonperforming at December 31, 2018, as presented in the table above, plus $6.8 billion of TDRs classified as performing at December 31, 2018. Approximately $388 million of the estimated $625 million in contractual interest was received and included in interest income for 2018.

(3) In 2018, $119 million in interest income was estimated to be contractually due on $1.1 billion of commercial loans and leases classified as nonperforming at December 31, 2018, as presented in the table above, plus $1.3 billion of TDRs classified as performing at December 31, 2018. Approximately $84 million of the estimated $119 million in contractual interest was received and included in interest income for 2018.

Table III Accruing Loans and Leases Past Due 90 Days or More [1]

	December 31				
(Dollars in millions)	**2018**	2017	2016	2015	2014
Consumer					
Residential mortgage [(2)]	**$ 1,884**	$ 3,230	$ 4,793	$ 7,150	$ 11,407
U.S. credit card	**994**	900	782	789	866
Non-U.S. credit card	**—**	—	66	76	95
Direct/Indirect consumer	**38**	40	34	39	64
Other consumer	**—**	—	4	3	1
Total consumer	**2,916**	4,170	5,679	8,057	12,433
Commercial					
U.S. commercial	**197**	144	106	113	110
Non-U.S. commercial	**—**	3	5	1	—
Commercial real estate	**4**	4	7	3	3
Commercial lease financing	**29**	19	19	15	40
	230	170	137	132	153
U.S. small business commercial	**84**	75	71	61	67
Total commercial	**314**	245	208	193	220
Total accruing loans and leases past due 90 days or more	**$ 3,230**	$ 4,415	$ 5,887	$ 8,250	$ 12,653

(1) Our policy is to classify consumer real estate-secured loans as nonperforming at 90 days past due, except the PCI loan portfolio, the fully-insured loan portfolio and loans accounted for under the fair value option.

(2) Balances are fully-insured loans.

Table IV Selected Loan Maturity Data [1, 2]

(Dollars in millions)	December 31, 2018 Due in One Year or Less	Due After One Year Through Five Years	Due After Five Years	Total
U.S. commercial	$ 74,365	$ 194,116	$ 47,888	**$ 316,369**
U.S. commercial real estate	11,622	40,393	4,590	**56,605**
Non-U.S. and other [3]	42,217	55,360	6,579	**104,156**
Total selected loans	**$ 128,204**	**$ 289,869**	**$ 59,057**	**$ 477,130**
Percent of total	27 %	61 %	12 %	**100 %**
Sensitivity of selected loans to changes in interest rates for loans due after one year:				
Fixed interest rates		$ 17,109	$ 27,664	
Floating or adjustable interest rates		272,760	31,393	
Total		**$ 289,869**	**$ 59,057**	

(1) Loan maturities are based on the remaining maturities under contractual terms.
(2) Includes loans accounted for under the fair value option.
(3) Loan maturities include non-U.S. commercial and commercial real estate loans.

Table V Allowance for Credit Losses

(Dollars in millions)	**2018**	2017	2016	2015	2014
Allowance for loan and lease losses, January 1	**$ 10,393**	$ 11,237	$ 12,234	$ 14,419	$ 17,428
Loans and leases charged off					
Residential mortgage	**(207)**	(188)	(403)	(866)	(855)
Home equity	**(483)**	(582)	(752)	(975)	(1,364)
U.S. credit card	**(3,345)**	(2,968)	(2,691)	(2,738)	(3,068)
Non-U.S. credit card [1]	**—**	(103)	(238)	(275)	(357)
Direct/Indirect consumer	**(495)**	(491)	(392)	(383)	(456)
Other consumer	**(197)**	(212)	(232)	(224)	(268)
Total consumer charge-offs	**(4,727)**	(4,544)	(4,708)	(5,461)	(6,368)
U.S. commercial [2]	**(575)**	(589)	(567)	(536)	(584)
Non-U.S. commercial	**(82)**	(446)	(133)	(59)	(35)
Commercial real estate	**(10)**	(24)	(10)	(30)	(29)
Commercial lease financing	**(8)**	(16)	(30)	(19)	(10)
Total commercial charge-offs	**(675)**	(1,075)	(740)	(644)	(658)
Total loans and leases charged off	**(5,402)**	(5,619)	(5,448)	(6,105)	(7,026)
Recoveries of loans and leases previously charged off					
Residential mortgage	**179**	288	272	393	969
Home equity	**485**	369	347	339	457
U.S. credit card	**508**	455	422	424	430
Non-U.S. credit card [1]	**—**	28	63	87	115
Direct/Indirect consumer	**300**	277	258	271	287
Other consumer	**15**	49	27	31	39
Total consumer recoveries	**1,487**	1,466	1,389	1,545	2,297
U.S. commercial [3]	**120**	142	175	172	214
Non-U.S. commercial	**14**	6	13	5	1
Commercial real estate	**9**	15	41	35	112
Commercial lease financing	**9**	11	9	10	19

Total commercial recoveries	**152**	174	238	222	346
Total recoveries of loans and leases previously charged off	**1,639**	1,640	1,627	1,767	2,643
Net charge-offs	**(3,763)**	(3,979)	(3,821)	(4,338)	(4,383)
Write-offs of PCI loans	**(273)**	(207)	(340)	(808)	(810)
Provision for loan and lease losses	**3,262**	3,381	3,581	3,043	2,231
Other [4]	**(18)**	(39)	(174)	(82)	(47)
Total allowance for loan and lease losses, December 31	**9,601**	10,393	11,480	12,234	14,419
Less: Allowance included in assets of business held for sale [5]	**—**	—	(243)	—	—
Allowance for loan and lease losses, December 31	**9,601**	10,393	11,237	12,234	14,419
Reserve for unfunded lending commitments, January 1	**777**	762	646	528	484
Provision for unfunded lending commitments	**20**	15	16	118	44
Other [4]	**—**	—	100	—	—
Reserve for unfunded lending commitments, December 31	**797**	777	762	646	528
Allowance for credit losses, December 31	**$10,398**	$11,170	$11,999	$12,880	$14,947

(1) Represents net charge-offs related to the non-U.S. credit card loan portfolio, which was sold in 2017.

(2) Includes U.S. small business commercial charge-offs of $287 million, $258 million, $253 million, $282 million and $345 million in 2018, 2017, 2016, 2015 and 2014, respectively.

(3) Includes U.S. small business commercial recoveries of $47 million, $43 million, $45 million, $57 million and $63 million in 2018, 2017, 2016, 2015 and 2014, respectively.

(4) Primarily represents the net impact of portfolio sales, consolidations and deconsolidations, foreign currency translation adjustments, transfers to held for sale and certain other reclassifications.

(5) Represents allowance related to the non-U.S. credit card loan portfolio, which was sold in 2017.

Table V Allowance for Credit Losses (continued)

(Dollars in millions)	2018	2017	2016	2015	2014
Loan and allowance ratios [6]:					
Loans and leases outstanding at December 31 [7]	**$942,546**	$931,039	$908,812	$890,045	$867,422
Allowance for loan and lease losses as a percentage of total loans and leases outstanding at December 31 [7]	**1.02 %**	1.12 %	1.26 %	1.37 %	1.66 %
Consumer allowance for loan and lease losses as a percentage of total consumer loans and leases outstanding at December 31 [8]	**1.08**	1.18	1.36	1.63	2.05
Commercial allowance for loan and lease losses as a percentage of total commercial loans and leases outstanding at December 31 [9]	**0.97**	1.05	1.16	1.11	1.16
Average loans and leases outstanding [7]	**$927,531**	$911,988	$892,255	$869,065	$888,804
Net charge-offs as a percentage of average loans and leases outstanding [7, 10]	**0.41 %**	0.44 %	0.43 %	0.50 %	0.49 %
Net charge-offs and PCI write-offs as a percentage of average loans and leases outstanding [7]	**0.44**	0.46	0.47	0.59	0.58
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases at December 31 [7]	**194**	161	149	130	121
Ratio of the allowance for loan and lease losses at December 31 to net charge-offs [10]	**2.55**	2.61	3.00	2.82	3.29
Ratio of the allowance for loan and lease losses at December 31 to net charge-offs and PCI write-offs	**2.38**	2.48	2.76	2.38	2.78
Amounts included in allowance for loan and lease losses for loans and leases that are excluded from nonperforming loans and leases at December 31 [11]	**$4,031**	$3,971	$3,951	$4,518	$5,944
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases, excluding the allowance for loan and lease losses for loans and leases that are excluded from nonperforming loans and leases at December 31 [7, 11]	**113 %**	99 %	98 %	82 %	71 %

(6) Loan and allowance ratios for 2016 include $243 million of non-U.S. credit card allowance for loan and lease losses and $9.2 billion of ending non-U.S. credit card loans, which were sold in 2017.

(7) Outstanding loan and lease balances and ratios do not include loans accounted for under the fair value option of $4.3 billion, $5.7 billion, $7.1 billion, $6.9 billion and $8.7 billion at December 31, 2018, 2017, 2016, 2015 and 2014, respectively. Average loans accounted for under the fair value option were $5.5 billion, $6.7 billion, $8.2 billion, $7.7 billion and $9.9 billion in 2018, 2017, 2016, 2015 and 2014, respectively.

(8) Excludes consumer loans accounted for under the fair value option of $682 million, $928 million, $1.1 billion, $1.9 billion and $2.1 billion at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.

(9) Excludes commercial loans accounted for under the fair value option of $3.7 billion, $4.8 billion, $6.0 billion, $5.1 billion and $6.6 billion at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.

(10) Net charge-offs exclude $273 million, $207 million, $340 million, $808 million and $810 million of write-offs in the PCI loan portfolio in 2018, 2017, 2016, 2015 and 2014 respectively. For more information on PCI write-offs, see Consumer Portfolio Credit Risk Management – Purchased Credit-impaired Loan Portfolio on page57.

(11) Primarily includes amounts allocated to U.S. credit card and unsecured consumer lending portfolios in *Consumer Banking* and PCI loans and the non-U.S. credit card portfolio in *All Other*.

Table VI Allocation of the Allowance for Credit Losses by Product Type

	December 31									
	2018		2017		2016		2015		2014	
(Dollars in millions)	**Amount**	**Percent of Total**	Amount	Percent of Total	Amount	Percent of Total	Amount	Percent of Total	Amount	Percent of Total
Allowance for loan and lease losses										
	$422	**4.40 %**	$701	6.74 %	$1,012	8.82 %	$1,500	12.26 %	$2,900	20.11 %

Residential mortgage										
Home equity	**506**	**5.27**	1,019	9.80	1,738	15.14	2,414	19.73	3,035	21.05
U.S. credit card	**3,597**	**37.47**	3,368	32.41	2,934	25.56	2,927	23.93	3,320	23.03
Non-U.S. credit card	**—**	**—**	—	—	243	2.12	274	2.24	369	2.56
Direct/Indirect consumer	**248**	**2.58**	264	2.54	244	2.13	223	1.82	299	2.07
Other consumer	**29**	**0.30**	31	0.30	51	0.44	47	0.38	59	0.41
Total consumer	**4,802**	**50.02**	**5,383**	**51.79**	**6,222**	**54.21**	**7,385**	**60.36**	**9,982**	**69.23**
U.S. commercial (1)	**3,010**	**31.35**	3,113	29.95	3,326	28.97	2,964	24.23	2,619	18.16
Non-U.S. commercial	**677**	**7.05**	803	7.73	874	7.61	754	6.17	649	4.50
Commercial real estate	**958**	**9.98**	935	9.00	920	8.01	967	7.90	1,016	7.05
Commercial lease financing	**154**	**1.60**	159	1.53	138	1.20	164	1.34	153	1.06
Total commercial	**4,799**	**49.98**	**5,010**	**48.21**	**5,258**	**45.79**	**4,849**	**39.64**	**4,437**	**30.77**
Total allowance for loan and lease losses (2)	**9,601**	**100.00%**	10,393	100.00%	11,480	100.00%	12,234	100.00%	14,419	100.00%
Less: Allowance included in assets of business held for sale (3)	**—**		—		(243)		—		—	
Allowance for loan and lease losses	**9,601**		10,393		11,237		12,234		14,419	
Reserve for unfunded lending commitments	**797**		777		762		646		528	
Allowance for credit losses	**$10,398**		$11,170		$11,999		$12,880		$14,947	

(1) Includes allowance for loan and lease losses for U.S. small business commercial loans of $474 million, $439 million, $416 million, $507 million and $536 million at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.

(2) Includes $91 million, $289 million, $419 million, $804 million and $1.7 billion of valuation allowance presented with the allowance for loan and lease losses related to PCI loans at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.

(3) Represents allowance for loan and lease losses related to the non-U.S. credit card loan portfolio, which was sold in 2017.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk

See Market Risk Management on page 70 in the MD&A and the sections referenced therein for Quantitative and Qualitative Disclosures about Market Risk.

Item 8. Financial Statements and Supplementary Data

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Report of Management on Internal Control Over Financial Reporting

The management of Bank of America Corporation is responsible for establishing and maintaining adequate internal control over financial reporting.

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

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

Management assessed the effectiveness of the Corporation's internal control over financial reporting as of December 31, 2018 based on the framework set forth by the Committee of Sponsoring Organizations of the Treadway Commission in *Internal Control – Integrated Framework (2013)*. Based on that assessment, management concluded that, as of December 31, 2018, the Corporation's internal control over financial reporting is effective.

The Corporation's internal control over financial reporting as ofDecember 31, 2018 has been audited by PricewaterhouseCoopers, LLP, an independent registered public accounting firm, as stated in their accompanying report which expresses an unqualified opinion on the effectiveness of the Corporation's internal control over financial reporting as of December 31, 2018.

Brian T. Moynihan
Chairman, Chief Executive Officer and President

Paul M. Donofrio
Chief Financial Officer

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Bank of America Corporation:

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Bank of America Corporation and its subsidiaries as of December 31, 2018 and December 31, 2017, and the related consolidated statements of income, comprehensive income, changes in shareholders' equity and cash flows for each of the three years in the period ended December 31, 2018, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Corporation's internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Corporation as of December 31, 2018 and December 31, 2017**,** and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Corporation maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

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

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

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

Definition and Limitations of Internal Control over Financial Reporting

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

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

Charlotte, North Carolina
February 26, 2019

We have served as the Corporation’s auditor since 1958.

Bank of America Corporation and Subsidiaries

Consolidated Statement of Income

(In millions, except per share information)	**2018**	2017	2016
Interest income			
Loans and leases	**$ 40,811**	$ 36,221	$ 33,228
Debt securities	**11,724**	10,471	9,167
Federal funds sold and securities borrowed or purchased under agreements to resell	**3,176**	2,390	1,118
Trading account assets	**4,811**	4,474	4,423
Other interest income	**6,247**	4,023	3,121
Total interest income	**66,769**	57,579	51,057
Interest expense			
Deposits	**4,495**	1,931	1,015
Short-term borrowings	**5,839**	3,538	2,350
Trading account liabilities	**1,358**	1,204	1,018
Long-term debt	**7,645**	6,239	5,578
Total interest expense	**19,337**	12,912	9,961
Net interest income	**47,432**	44,667	41,096
Noninterest income			
Card income	**6,051**	5,902	5,851
Service charges	**7,767**	7,818	7,638
Investment and brokerage services	**14,160**	13,836	13,349
Investment banking income	**5,327**	6,011	5,241
Trading account profits	**8,540**	7,277	6,902
Other income	**1,970**	1,841	3,624
Total noninterest income	**43,815**	42,685	42,605
Total revenue, net of interest expense	**91,247**	87,352	83,701
Provision for credit losses	**3,282**	3,396	3,597
Noninterest expense			
Personnel	**31,880**	31,931	32,018
Occupancy	**4,066**	4,009	4,038
Equipment	**1,705**	1,692	1,804
Marketing	**1,674**	1,746	1,703
Professional fees	**1,699**	1,888	1,971
Data processing	**3,222**	3,139	3,007
Telecommunications	**699**	699	746
Other general operating	**8,436**	9,639	9,796
Total noninterest expense	**53,381**	54,743	55,083
Income before income taxes	**34,584**	29,213	25,021
Income tax expense	**6,437**	10,981	7,199
Net income	**$ 28,147**	$ 18,232	$ 17,822
Preferred stock dividends	**1,451**	1,614	1,682
Net income applicable to common shareholders	**$ 26,696**	$ 16,618	$ 16,140

Per common share information			
Earnings	**$ 2.64**	$ 1.63	$ 1.57
Diluted earnings	**2.61**	1.56	1.49
Average common shares issued and outstanding	**10,096.5**	10,195.6	10,284.1
Average diluted common shares issued and outstanding	**10,236.9**	10,778.4	11,046.8

Consolidated Statement of Comprehensive Income

(Dollars in millions)	**2018**	2017	2016
Net income	**$ 28,147**	$ 18,232	$ 17,822
Other comprehensive income (loss), net-of-tax:			
Net change in debt and equity securities	**(3,953)**	61	(1,345)
Net change in debit valuation adjustments	**749**	(293)	(156)
Net change in derivatives	**(53)**	64	182
Employee benefit plan adjustments	**(405)**	288	(524)
Net change in foreign currency translation adjustments	**(254)**	86	(87)
Other comprehensive income (loss)	**(3,916)**	206	(1,930)
Comprehensive income	**$ 24,231**	$ 18,438	$ 15,892

See accompanying Notes to Consolidated Financial Statements.

Bank of America Corporation and Subsidiaries

Consolidated Balance Sheet

(Dollars in millions)	December 31 2018	2017
Assets		
Cash and due from banks	**$ 29,063**	$ 29,480
Interest-bearing deposits with the Federal Reserve, non-U.S. central banks and other banks	**148,341**	127,954
Cash and cash equivalents	**177,404**	157,434
Time deposits placed and other short-term investments	**7,494**	11,153
Federal funds sold and securities borrowed or purchased under agreements to resell (includes **$56,399** and $52,906 measured at fair value)	**261,131**	212,747
Trading account assets (includes **$119,363** and $106,274 pledged as collateral)	**214,348**	209,358
Derivative assets	**43,725**	37,762
Debt securities:		
Carried at fair value	**238,101**	315,117
Held-to-maturity, at cost (fair value – **$200,435** and $123,299)	**203,652**	125,013
Total debt securities	441,753	440,130
Loans and leases (includes **$4,349** and $5,710 measured at fair value)	**946,895**	936,749
Allowance for loan and lease losses	**(9,601)**	(10,393)
Loans and leases, net of allowance	937,294	926,356
Premises and equipment, net	**9,906**	9,247
Goodwill	**68,951**	68,951
Loans held-for-sale (includes **$2,942** and $2,156 measured at fair value)	**10,367**	11,430
Customer and other receivables	**65,814**	61,623
Other assets (includes **$19,739** and $22,581 measured at fair value)	**116,320**	135,043
Total assets	**$ 2,354,507**	$ 2,281,234
Liabilities		
Deposits in U.S. offices:		
Noninterest-bearing	**$ 412,587**	$ 430,650
Interest-bearing (includes **$492** and $449 measured at fair value)	**891,636**	796,576
Deposits in non-U.S. offices:		
Noninterest-bearing	**14,060**	14,024
Interest-bearing	**63,193**	68,295
Total deposits	**1,381,476**	1,309,545
Federal funds purchased and securities loaned or sold under agreements to repurchase (includes **$28,875** and $36,182 measured at fair value)	**186,988**	176,865
Trading account liabilities	**68,220**	81,187
Derivative liabilities	**37,891**	34,300
Short-term borrowings (includes **$1,648** and $1,494 measured at fair value)	**20,189**	32,666
Accrued expenses and other liabilities (includes **$20,075** and $22,840 measured at fair value and **$797** and $777 of reserve for unfunded lending commitments)	**165,078**	152,123
Long-term debt (includes **$27,637** and $31,786 measured at fair value)	**229,340**	227,402
Total liabilities	**2,089,182**	2,014,088
Commitments and contingencies *(Note 7 – Securitizations and Other Variable Interest Entities* and *Note 12 – Commitments and Contingencies)*		
Shareholders' equity		
Preferred stock, $0.01 par value; authorized – **100,000,000** shares; issued and outstanding – **3,843,140** and 3,837,683 shares	**22,326**	22,323

Common stock and additional paid-in capital, $0.01 par value; authorized – **12,800,000,000** shares; issued and outstanding – **9,669,286,370** and 10,287,302,431 shares	**118,896**	138,089
Retained earnings	**136,314**	113,816
Accumulated other comprehensive income (loss)	**(12,211)**	(7,082)
Total shareholders' equity	**265,325**	267,146
Total liabilities and shareholders' equity	**$ 2,354,507**	$ 2,281,234

Assets of consolidated variable interest entities included in total assets above (isolated to settle the liabilities of the variable interest entities)		
Trading account assets	**$ 5,798**	$ 6,521
Loans and leases	**43,850**	48,929
Allowance for loan and lease losses	**(912)**	(1,016)
Loans and leases, net of allowance	**42,938**	47,913
All other assets	**337**	1,721
Total assets of consolidated variable interest entities	**$ 49,073**	$ 56,155
Liabilities of consolidated variable interest entities included in total liabilities above		
Short-term borrowings	**$ 742**	$ 312
Long-term debt (includes **$10,943** and $9,872 of non-recourse debt)	**10,944**	9,873
All other liabilities (includes **$27** and $34 of non-recourse liabilities)	**30**	37
Total liabilities of consolidated variable interest entities	**$ 11,716**	$ 10,222

See accompanying Notes to Consolidated Financial Statements.

Bank of America Corporation and Subsidiaries

Consolidated Statement of Changes in Shareholders’ Equity

(In millions)	Preferred Stock	Common Stock and Additional Paid-in Capital Shares	Common Stock and Additional Paid-in Capital Amount	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Total Shareholders’ Equity
Balance, December 31, 2015	$ 22,273	10,380.3	$ 151,042	$ 87,658	$ (5,358)	$ 255,615
Net income				17,822		17,822
Net change in debt and equity securities					(1,345)	(1,345)
Net change in debit valuation adjustments					(156)	(156)
Net change in derivatives					182	182
Employee benefit plan adjustments					(524)	(524)
Net change in foreign currency translation adjustments					(87)	(87)
Dividends declared:						
Common				(2,573)		(2,573)
Preferred				(1,682)		(1,682)
Issuance of preferred stock	2,947					2,947
Common stock issued under employee plans, net, and related tax effects		5.1	1,108			1,108
Common stock repurchased		(332.8)	(5,112)			(5,112)
Balance, December 31, 2016	$ 25,220	10,052.6	$ 147,038	$ 101,225	$ (7,288)	$ 266,195
Net income				18,232		18,232
Net change in debt and equity securities					61	61
Net change in debit valuation adjustments					(293)	(293)
Net change in derivatives					64	64
Employee benefit plan adjustments					288	288
Net change in foreign currency translation adjustments					86	86
Dividends declared:						
Common				(4,027)		(4,027)
Preferred				(1,578)		(1,578)
Common stock issued in connection with exercise of warrants and exchange of preferred stock	(2,897)	700.0	2,933	(36)		—
Common stock issued under employee plans, net, and other		43.3	932			932
Common stock repurchased		(508.6)	(12,814)			(12,814)
Balance, December 31, 2017	$ 22,323	10,287.3	$ 138,089	$ 113,816	$ (7,082)	$ 267,146
Cumulative adjustment for adoption of hedge accounting standard				**(32)**	**57**	**25**
Adoption of accounting standard related to certain tax effects stranded in accumulated other comprehensive income (loss)				**1,270**	**(1,270)**	**—**
Net income				**28,147**		**28,147**
Net change in debt and equity securities					**(3,953)**	**(3,953)**
Net change in debit valuation adjustments					**749**	**749**
Net change in derivatives					**(53)**	**(53)**
Employee benefit plan adjustments					**(405)**	**(405)**
Net change in foreign currency translation adjustments					**(254)**	**(254)**
Dividends declared:						
Common				**(5,424)**		**(5,424)**

Preferred				**(1,451)**		**(1,451)**
Issuance of preferred stock	**4,515**					**4,515**
Redemption of preferred stock	**(4,512)**					**(4,512)**
Common stock issued under employee plans, net, and other		**58.2**	**901**	**(12)**		**889**
Common stock repurchased		**(676.2)**	**(20,094)**			**(20,094)**
Balance, December 31, 2018	**$ 22,326**	**9,669.3**	**$ 118,896**	**$ 136,314**	**$ (12,211)**	**$ 265,325**

See accompanying Notes to Consolidated Financial Statements.

Bank of America Corporation and Subsidiaries

Consolidated Statement of Cash Flows

(Dollars in millions)	**2018**	2017	2016
Operating activities			
Net income	**$ 28,147**	$ 18,232	$ 17,822
Adjustments to reconcile net income to net cash provided by operating activities:			
Provision for credit losses	**3,282**	3,396	3,597
Gains on sales of debt securities	**(154)**	(255)	(490)
Depreciation and premises improvements amortization	**1,525**	1,482	1,511
Amortization of intangibles	**538**	621	730
Net amortization of premium/discount on debt securities	**1,824**	2,251	3,134
Deferred income taxes	**3,041**	8,175	5,793
Stock-based compensation	**1,729**	1,649	1,367
Loans held-for-sale:			
Originations and purchases	**(28,071)**	(43,506)	(33,107)
Proceeds from sales and paydowns of loans originally classified as held for sale and instruments from related securitization activities	**28,972**	40,548	32,588
Net change in:			
Trading and derivative instruments	**(23,673)**	(14,663)	(2,635)
Other assets	**11,920**	(20,090)	(14,103)
Accrued expenses and other liabilities	**13,010**	4,673	(35)
Other operating activities, net	**(2,570)**	7,351	1,105
Net cash provided by operating activities	**39,520**	9,864	17,277
Investing activities			
Net change in:			
Time deposits placed and other short-term investments	**3,659**	(1,292)	(2,117)
Federal funds sold and securities borrowed or purchased under agreements to resell	**(48,384)**	(14,523)	(5,742)
Debt securities carried at fair value:			
Proceeds from sales	**5,117**	73,353	71,547
Proceeds from paydowns and maturities	**78,513**	93,874	108,592
Purchases	**(76,640)**	(166,975)	(189,061)
Held-to-maturity debt securities:			
Proceeds from paydowns and maturities	**18,789**	16,653	18,677
Purchases	**(35,980)**	(25,088)	(39,899)
Loans and leases:			
Proceeds from sales of loans originally classified as held for investment and instruments from related securitization activities	**21,365**	11,996	18,787
Purchases	**(4,629)**	(6,846)	(12,283)
Other changes in loans and leases, net	**(31,292)**	(41,104)	(31,194)
Other investing activities, net	**(1,986)**	8,411	408
Net cash used in investing activities	**(71,468)**	(51,541)	(62,285)
Financing activities			
Net change in:			
Deposits	**71,931**	48,611	63,675
Federal funds purchased and securities loaned or sold under agreements to repurchase	**10,070**	7,024	(4,000)
Short-term borrowings	**(12,478)**	8,538	(4,014)
Long-term debt:			
Proceeds from issuance	**64,278**	53,486	35,537

Retirement	**(53,046)**	(49,480)	(51,623)
Preferred stock:			
Proceeds from issuance	**4,515**	—	2,947
Redemption	**(4,512)**	—	—
Common stock repurchased	**(20,094)**	(12,814)	(5,112)
Cash dividends paid	**(6,895)**	(5,700)	(4,194)
Other financing activities, net	**(651)**	(397)	(63)
Net cash provided by financing activities	**53,118**	49,268	33,153
Effect of exchange rate changes on cash and cash equivalents	**(1,200)**	2,105	240
Net increase (decrease) in cash and cash equivalents	**19,970**	9,696	(11,615)
Cash and cash equivalents at January 1	**157,434**	147,738	159,353
Cash and cash equivalents at December 31	**$ 177,404**	$ 157,434	$ 147,738
Supplemental cash flow disclosures			
Interest paid	**$ 19,087**	$ 12,852	$ 10,510
Income taxes paid, net	**2,470**	3,235	1,043

See accompanying Notes to Consolidated Financial Statements.

Bank of America Corporation and Subsidiaries

Notes to Consolidated Financial Statements

NOTE 1 Summary of Significant Accounting Principles

Bank of America Corporation, a bank holding company and a financial holding company, provides a diverse range of financial services and products throughout the U.S. and in certain international markets. The term "the Corporation" as used herein may refer to Bank of America Corporation, individually, Bank of America Corporation and its subsidiaries, or certain of Bank of America Corporation's subsidiaries or affiliates.

Principles of Consolidation and Basis of Presentation

The Consolidated Financial Statements include the accounts of the Corporation and its majority-owned subsidiaries and those variable interest entities (VIEs) where the Corporation is the primary beneficiary. Intercompany accounts and transactions have been eliminated. Results of operations of acquired companies are included from the dates of acquisition and for VIEs, from the dates that the Corporation became the primary beneficiary. Assets held in an agency or fiduciary capacity are not included in the Consolidated Financial Statements. The Corporation accounts for investments in companies for which it owns a voting interest and for which it has the ability to exercise significant influence over operating and financing decisions using the equity method of accounting. These investments are included in other assets. Equity method investments are subject to impairment testing, and the Corporation's proportionate share of income or loss is included in other income.

The preparation of the Consolidated Financial Statements in conformity with accounting principles generally accepted in the United States of America (GAAP) requires management to make estimates and assumptions that affect reported amounts and disclosures. Realized results could materially differ from those estimates and assumptions. Certain prior-period amounts have been reclassified to conform to current-period presentation.

New Accounting Standards

Effective January 1, 2018, the Corporation adopted the following new accounting standards on a prospective basis.

- **Revenue Recognition** – The new accounting standard addresses the recognition of revenue from contracts with customers. For additional information, see Revenue Recognition Accounting Policies in this Note, and .
- **Hedge Accounting** – The new accounting standard simplifies and expands the ability to apply hedge accounting to certain risk management activities. For additional information, see .
- **Recognition and Measurement of Financial Assets and Liabilities** – The new accounting standard relates to the recognition and measurement of financial instruments, including equity investments. For additional information, see and .
- **Tax Effects in Accumulated Other Comprehensive Income** – The new accounting standard addresses certain tax effects stranded in accumulated other comprehensive income (OCI) related to the 2017 Tax Cuts and Job Act (the Tax Act). For additional information, see .

Effective January 1, 2018, the Corporation adopted the following new accounting standards on a retrospective basis, resulting in restatement of all prior periods presented in the Consolidated Statement of Income and the Consolidated Statement of Cash Flows. The changes in presentation are not material to the individual line items affected.

- **Presentation of Pension Costs** – The new accounting standard requires separate presentation of the service cost component of pension expense from all other components of net pension benefit/cost in the Consolidated Statement of Income. As a result, the service cost component continues to be presented in personnel expense while other components of net pension benefit/cost (e.g., interest cost, actual return on plan assets, amortization of prior service cost) are now presented in other general operating expense. For additional information, see .
- **Classification of Cash Flows and Restricted Cash** – The new accounting standards address the classification of certain cash receipts and cash payments in the statement of cash flows as well as the presentation and disclosure of restricted cash. For more information on restricted cash, see .

Lease Accounting

On January 1, 2019, the Corporation adopted the new accounting standards that require lessees to recognize operating leases on the Consolidated Balance Sheet as right-of-use assets and lease liabilities based on the value of the discounted future lease payments. Lessor accounting is largely unchanged. Expanded disclosures about the nature and terms of lease agreements will be required prospectively. The Corporation elected to apply certain transition elections which allow for the continued application of the previous determination of whether a contract that existed at transition is or contains a lease, the associated lease classification, and the recognition of leases on January 1, 2019 through a cumulative-effect adjustment to retained earnings, with no adjustment to comparative prior periods presented. Upon adoption, the Corporation recognized right-of-use assets and lease liabilities of $9.7 billion. Adoption of the standard did not have a significant effect on the Corporation's regulatory capital measures.

Accounting Standards Issued and Not Yet Adopted

Accounting for Financial Instruments -- Credit Losses

The Financial Accounting Standards Board issued a new accounting standard that will be effective for the Corporation on January 1, 2020. The standard replaces the existing measurement of the allowance for credit losses that is based on management’s best estimate of probable credit losses inherent in the Corporation’s lending activities with management’s best estimate of lifetime expected credit losses inherent in the Corporation’s financial assets that are recognized at amortized cost. The standard will also expand credit quality disclosures. While the standard changes the measurement of the allowance for credit losses, it does not change the Corporation’s credit risk of its lending portfolios. The credit loss estimation models and processes to be used in implementing the new standard have largely been designed and developed. The validation of the models and testing of controls are in process and expected to be completed during 2019. Currently, the impact of this new accounting standard may be an increase in the Corporation’s allowance for credit losses at the date of adoption which would have a resulting negative adjustment to retained earnings. The ultimate impact will be dependent on the characteristics of the

Corporation's portfolio at adoption date as well as the macroeconomic conditions and forecasts as of that date.

Significant Accounting Principles

Cash and Cash Equivalents

Cash and cash equivalents include cash on hand, cash items in the process of collection, cash segregated under federal and other brokerage regulations, and amounts due from correspondent banks, the Federal Reserve Bank and certain non-U.S. central banks. Certain cash balances are restricted as to withdrawal or usage by legal binding contractual agreements or regulatory requirements.

Securities Financing Agreements

Securities borrowed or purchased under agreements to resell and securities loaned or sold under agreements to repurchase (securities financing agreements) are treated as collateralized financing transactions except in instances where the transaction is required to be accounted for as individual sale and purchase transactions. Generally, these agreements are recorded at acquisition or sale price plus accrued interest, except for certain securities financing agreements that the Corporation accounts for under the fair value option. Changes in the fair value of securities financing agreements that are accounted for under the fair value option are recorded in trading account profits in the Consolidated Statement of Income.

The Corporation's policy is to monitor the market value of the principal amount loaned under resale agreements and obtain collateral from or return collateral pledged to counterparties when appropriate. Securities financing agreements do not create material credit risk due to these collateral provisions; therefore, an allowance for loan losses is not necessary.

In transactions where the Corporation acts as the lender in a securities lending agreement and receives securities that can be pledged or sold as collateral, it recognizes an asset on the Consolidated Balance Sheet at fair value, representing the securities received, and a liability, representing the obligation to return those securities.

Collateral

The Corporation accepts securities and loans as collateral that it is permitted by contract or practice to sell or repledge. At December 31, 2018 and 2017, the fair value of this collateral was $599.0 billion and $561.9 billion, of which $508.6 billion and $476.1 billion were sold or repledged. The primary source of this collateral is securities borrowed or purchased under agreements to resell.

The Corporation also pledges company-owned securities and loans as collateral in transactions that include repurchase agreements, securities loaned, public and trust deposits, U.S. Treasury tax and loan notes, and short-term borrowings. This collateral, which in some cases can be sold or repledged by the counterparties to the transactions, is parenthetically disclosed on the Consolidated Balance Sheet.

In certain cases, the Corporation has transferred assets to consolidated VIEs where those restricted assets serve as collateral for the interests issued by the VIEs. These assets are included on the Consolidated Balance Sheet in Assets of Consolidated VIEs.

In addition, the Corporation obtains collateral in connection with its derivative contracts. Required collateral levels vary depending on the credit risk rating and the type of counterparty. Generally, the Corporation accepts collateral in the form of cash, U.S. Treasury securities and other marketable securities. Based on provisions contained in master netting agreements, the

Corporation nets cash collateral received against derivative assets. The Corporation also pledges collateral on its own derivative positions which can be applied against derivative liabilities.

Trading Instruments

Financial instruments utilized in trading activities are carried at fair value. Fair value is generally based on quoted market prices for the same or similar assets and liabilities. If these market prices are not available, fair values are estimated based on dealer quotes, pricing models, discounted cash flow methodologies, or similar techniques where the determination of fair value may require significant management judgment or estimation. Realized gains and losses are recorded on a trade-date basis. Realized and unrealized gains and losses are recognized in trading account profits.

Derivatives and Hedging Activities

Derivatives are entered into on behalf of customers, for trading or to support risk management activities. Derivatives used in risk management activities include derivatives that are both designated in qualifying accounting hedge relationships and derivatives used to hedge market risks in relationships that are not designated in qualifying accounting hedge relationships (referred to as other risk management activities). The Corporation manages interest rate and foreign currency exchange rate sensitivity predominantly through the use of derivatives. Derivatives utilized by the Corporation include swaps, futures and forward settlement contracts, and option contracts.

All derivatives are recorded on the Consolidated Balance Sheet at fair value, taking into consideration the effects of legally enforceable master netting agreements that allow the Corporation to settle positive and negative positions and offset cash collateral held with the same counterparty on a net basis. For exchange-traded contracts, fair value is based on quoted market prices in active or inactive markets or is derived from observable market- based pricing parameters, similar to those applied to over-the-counter (OTC) derivatives. For non-exchange traded contracts, fair value is based on dealer quotes, pricing models, discounted cash flow methodologies or similar techniques for which the determination of fair value may require significant management judgment or estimation.

Valuations of derivative assets and liabilities reflect the value of the instrument including counterparty credit risk. These values also take into account the Corporation's own credit standing.

Trading Derivatives and Other Risk Management Activities

Derivatives held for trading purposes are included in derivative assets or derivative liabilities on the Consolidated Balance Sheet with changes in fair value included in trading account profits.

Derivatives used for other risk management activities are included in derivative assets or derivative liabilities. Derivatives used in other risk management activities have not been designated in qualifying accounting hedge relationships because they did not qualify or the risk that is being mitigated pertains to an item that is reported at fair value through earnings so that the effect of measuring the derivative instrument and the asset or liability to which the risk exposure pertains will offset in the Consolidated Statement of Income to the extent effective. The changes in the fair value of derivatives that serve to mitigate certain risks associated with mortgage servicing rights (MSRs), interest rate lock commitments (IRLCs) and first-lien mortgage loans held-for-sale (LHFS) that are originated by the Corporation are recorded in other income. Changes in the fair value of derivatives that serve to mitigate interest rate risk and foreign currency risk are included in other income. Credit derivatives are also used by the Corporation to mitigate the risk associated with various credit exposures. The changes in the fair value of these derivatives are included in other income.

Derivatives Used For Hedge Accounting Purposes (Accounting Hedges)

For accounting hedges, the Corporation formally documents at inception all relationships between hedging instruments and hedged items, as well as the risk management objectives and strategies for undertaking various accounting hedges. Additionally, the Corporation primarily uses regression analysis at the inception of a hedge and for each reporting period thereafter to assess whether the derivative used in an accounting hedge transaction is expected to be and has been highly effective in offsetting changes in the fair value or cash flows of a hedged item or forecasted transaction. The Corporation discontinues hedge accounting when it is determined that a derivative is not expected to be or has ceased to be highly effective as a hedge, and then reflects changes in fair value of the derivative in earnings after termination of the hedge relationship.

Fair value hedges are used to protect against changes in the fair value of the Corporation’s assets and liabilities that are attributable to interest rate or foreign exchange volatility. Changes in the fair value of derivatives designated as fair value hedges are recorded in earnings, together and in the same income statement line item with changes in the fair value of the related hedged item. If a derivative instrument in a fair value hedge is terminated or the hedge designation removed, the previous adjustments to the carrying value of the hedged asset or liability are subsequently accounted for in the same manner as other components of the carrying value of that asset or liability. For interest-earning assets and interest-bearing liabilities, such adjustments are amortized to earnings over the remaining life of the respective asset or liability.

Cash flow hedges are used primarily to minimize the variability in cash flows of assets and liabilities or forecasted transactions caused by interest rate or foreign exchange rate fluctuations. Changes in the fair value of derivatives used in cash flow hedges are recorded in accumulated OCI and are reclassified into the line item in the income statement in which the hedged item is recorded in the same period the hedged item affects earnings. Components of a derivative that are excluded in assessing hedge effectiveness are recorded in the same income statement line item as the hedged item.

Net investment hedges are used to manage the foreign exchange rate sensitivity arising from a net investment in a foreign operation. Changes in the spot prices of derivatives that are designated as net investment hedges of foreign operations are recorded as a component of accumulated OCI. The remaining components of these derivatives are excluded in assessing hedge effectiveness and are recorded in other income.

Securities

Debt securities are reported on the Consolidated Balance Sheet at their trade date. Their classification is dependent on the purpose for which the securities were acquired. Debt securities purchased for use in the Corporation’s trading activities are reported in trading account assets at fair value with unrealized gains and losses included in trading account profits. Substantially all other debt securities purchased are used in the Corporation’s asset and liability management (ALM) activities and are reported on the Consolidated Balance Sheet as either debt securities carried at fair value or as held-to-maturity (HTM) debt securities. Debt securities carried at fair value are either available-for-sale (AFS)

securities with unrealized gains and losses net-of-tax included in accumulated OCI or carried at fair value with unrealized gains and losses reported in other income. HTM debt securities, which are certain debt securities that management has the intent and ability to hold to maturity, are reported at amortized cost.

The Corporation regularly evaluates each AFS and HTM debt security where the value has declined below amortized cost to assess whether the decline in fair value is other than temporary. In determining whether an impairment is other than temporary, the Corporation considers the severity and duration of the decline in fair value, the length of time expected for recovery, the financial condition of the issuer, and other qualitative factors, as well as whether the Corporation either plans to sell the security or it is more likely than not that it will be required to sell the security before recovery of the amortized cost. For AFS debt securities the Corporation intends to hold, an analysis is performed to determine how much of the decline in fair value is related to the issuer’s credit and how much is related to market factors (e.g., interest rates). If any of the decline in fair value is due to credit, an other-than-temporary impairment (OTTI) loss is recognized in the Consolidated Statement of Income for that amount. If any of the decline in fair value is related to market factors, that amount is recognized in accumulated OCI. In certain instances, the credit loss may exceed the total decline in fair value, in which case, the difference is due to market factors and is recognized as an unrealized gain in accumulated OCI. If the Corporation intends to sell or believes it is more likely than not that it will be required to sell the debt security, it is written down to fair value as an OTTI loss.

Interest on debt securities, including amortization of premiums and accretion of discounts, is included in interest income. Premiums and discounts are amortized or accreted to interest income at a constant effective yield over the contractual lives of the securities. Realized gains and losses from the sales of debt securities are determined using the specific identification method.

Equity securities with readily determinable fair values that are not held for trading purposes are carried at fair value with unrealized gains and losses included in other income. Equity securities that do not have readily determinable fair values are held at cost and evaluated for impairment. These securities are reported in other assets or time deposits placed and other short-term investments.

Loans and Leases

Loans, with the exception of loans accounted for under the fair value option, are measured at historical cost and reported at their outstanding principal balances net of any unearned income, charge-offs, unamortized deferred fees and costs on originated loans, and for purchased loans, net of any unamortized premiums or discounts. Loan origination fees and certain direct origination costs are deferred and recognized as adjustments to interest income over the lives of the related loans. Unearned income, discounts and premiums are amortized to interest income using a level yield methodology. The Corporation elects to account for certain consumer and commercial loans under the fair value option with changes in fair value reported in other income.

Under applicable accounting guidance, for reporting purposes, the loan and lease portfolio is categorized by portfolio segment and, within each portfolio segment, by class of financing receivables. A portfolio segment is defined as the level at which an entity develops and documents a systematic methodology to determine the allowance for credit losses, and a class of financing receivables is defined as the level of disaggregation of portfolio segments based on the initial measurement attribute, risk characteristics and methods for assessing risk. The Corporation'sthree portfolio segments are Consumer Real Estate, Credit Card and Other Consumer, and Commercial. The classes within the Consumer Real Estate portfolio segment are residential mortgage and home equity. The classes within the Credit Card and Other Consumer portfolio segment are U.S. credit card, direct/indirect consumer and other consumer. The classes within the Commercial portfolio segment are U.S. commercial, non-U.S. commercial, commercial real estate, commercial lease financing and U.S. small business commercial.

Purchased Credit-impaired Loans

At acquisition, purchased credit-impaired (PCI) loans are recorded at fair value with no allowance for credit losses, and accounted for individually or aggregated in pools based on similar risk characteristics. The expected cash flows in excess of the amount paid for the loans is referred to as the accretable yield and is recorded as interest income over the remaining estimated life of the loan or pool of loans. The excess of the contractual principal and interest over the expected cash flows of the PCI loans is referred to as the nonaccretable difference. If, upon subsequent valuation, the Corporation determines it is probable that the present value of the expected cash flows has decreased, a charge to the provision for credit losses is recorded. If it is probable that there is a significant increase in the present value of expected cash flows, the allowance for credit losses is reduced or, if there is no remaining allowance for credit losses related to these PCI loans, the accretable yield is increased through a reclassification from nonaccretable difference, resulting in a prospective increase in interest income. Reclassifications to or from nonaccretable difference can also occur for changes in the estimated lives of the PCI loans. If a loan within a PCI pool is sold, foreclosed, forgiven or the expectation of any future proceeds is remote, the loan is removed from the pool at its proportional carrying value. If the loan's recovery value is less than its carrying value, the difference is first applied against the PCI pool's nonaccretable difference and then against the allowance for credit losses.

Leases

The Corporation provides equipment financing to its customers through a variety of lease arrangements. Direct financing leases are carried at the aggregate of lease payments receivable plus estimated residual value of the leased property less unearned income. Leveraged leases, which are a form of financing leases, are reported net of non-recourse debt. Unearned income on leveraged and direct financing leases is accreted to interest income over the lease terms using methods that approximate the interest method.

Allowance for Credit Losses

The allowance for credit losses, which includes the allowance for loan and lease losses and the reserve for unfunded lending commitments, represents management's estimate of probable incurred credit losses in the Corporation's loan and lease portfolio excluding loans and unfunded lending commitments accounted for under the fair value option. The allowance for credit losses includes both quantitative and qualitative components. The qualitative component has a higher degree of management subjectivity, and includes factors such as concentrations, economic conditions and other considerations. The allowance for loan and lease losses represents the estimated probable credit losses on funded consumer and commercial loans and leases while the reserve for unfunded lending commitments, including standby letters of credit (SBLCs) and binding unfunded loan commitments, represents estimated probable credit losses o

n these unfunded credit instruments based on utilization assumptions. Lending-related credit exposures deemed to be uncollectible, excluding loans carried at fair value, are charged off against these accounts.

The Corporation performs periodic and systematic detailed reviews of its lending portfolios to identify credit risks and to assess the overall collectability of those portfolios. The allowance on certain homogeneous consumer loan portfolios, which generally consist of consumer real estate loans within the Consumer Real Estate portfolio segment and credit card loans within the Credit Card and Other Consumer portfolio segment, is based on aggregated portfolio segment evaluations generally by product type. Loss forecast models are utilized for these portfolios which consider a variety of factors including, but not limited to, historical loss experience, estimated defaults or foreclosures based on portfolio trends, delinquencies, bankruptcies, economic conditions, credit scores and the amount of loss in the event of default.

For consumer loans secured by residential real estate, using statistical modeling methodologies, the Corporation estimates the number of loans that will default based on the individual loan attributes aggregated into pools of homogeneous loans with similar attributes. The attributes that are most significant to the probability of default and are used to estimate defaults include refreshed loan-to-value (LTV) or, in the case of a subordinated lien, refreshed combined LTV (CLTV), borrower credit score, months since origination (referred to as vintage) and geography, all of which are further broken down by present collection status (whether the loan is current, delinquent, in default or in bankruptcy). The severity or loss given default is estimated based on the refreshed LTV for first-lien mortgages or CLTV for subordinated liens. The estimates are based on the Corporation's historical experience with the loan portfolio, adjusted to reflect an assessment of environmental factors not yet reflected in the historical data underlying the loss estimates, such as changes in real estate values, local and national economies, underwriting standards and the regulatory environment. The probability of default models also incorporate recent experience with modification programs including re-defaults subsequent to modification, a loan's default history prior to modification and the change in borrower payments post-modification. On home equity loans where the Corporation holds only a second-lien position and foreclosure is not the best alternative, the loss severity is estimated at 100 percent.

The allowance on certain commercial loans (except business card and certain small business loans) is calculated using loss rates delineated by risk rating and product type. Factors considered when assessing loss rates include the value of the underlying collateral, if applicable, the industry of the obligor, and the obligor's liquidity and other financial indicators along with certain qualitative factors. These statistical models are updated regularly for changes in economic and business conditions. Included in the analysis of consumer and commercial loan portfolios are qualitative estimates which are maintained to cover uncertainties that affect the Corporation's estimate of probable losses including domestic and global economic uncertainty and large single-name defaults.

For individually impaired loans, which include nonperforming commercial loans as well as consumer and commercial loans and leases modified in a troubled debt restructuring (TDR), management measures impairment pr ased on the present value of payments expected to be received, discounted at the loans' original effective contractual interest rates. Credit card loans are discounted at the portfolio average contractual annual percentage rate, excluding promotionally priced loans, in effect prior to restructuring. Impaired loans and TDRs may also be measured based on observable market prices, or for loans that are solely dependent on the collateral for repayment, the estimated fair value of the collateral less costs to sell. If the recorded investment in impaired loans exceeds this amount, a specific allowance is established as part of the allowance for loan and lease losses unless these are secured consumer loans that are solely dependent on collateral for repayment, in which case the amount that exceeds the fair value of the collateral is charged off.

Generally, the Corporation initially estimates the fair value of the collateral securing these consumer real estate-secured loans using an automated valuation model (AVM). An AVM is a tool that estimates the value of a property by reference to market data including sales of comparable properties and price trends specific to the Metropolitan Statistical Area in which the property being valued is located. In the event that an AVM value is not available, the Corporation utilizes publicized indices or if these methods provide less reliable valuations, the Corporation uses appraisals or broker price opinions to estimate the fair value of the collateral. While there is inherent imprecision in these valuations, the Corporation believes that they are representative of the portfolio in the aggregate.

In addition to the allowance for loan and lease losses, the Corporation also estimates probable losses related to unfunded lending commitments, such as letters of credit, financial guarantees and binding unfunded loan commitments. Unfunded lending commitments are subject to individual reviews and are analyzed and segregated by risk according to the Corporation's internal risk rating scale. These risk classifications, in conjunction with an analysis of historical loss experience, utilization assumptions, current economic conditions, performance trends within the portfolio and any other pertinent information, result in the estimation of the reserve for unfunded lending commitments.

The allowance for credit losses related to the loan and lease portfolio is reported separately on the Consolidated Balance Sheet whereas the reserve for unfunded lending commitments is reported on the Consolidated Balance Sheet in accrued expenses and other liabilities. The provision for credit losses related to the loan and lease portfolio and unfunded lending commitments is reported in the Consolidated Statement of Income.

Nonperforming Loans and Leases, Charge-offs and Delinquencies

Nonperforming loans and leases generally include loans and leases that have been placed on nonaccrual status. Loans accounted for under the fair value option, PCI loans and LHFS are not reported as nonperforming.

In accordance with the Corporation's policies, consumer real estate-secured loans, including residential mortgages and home equity loans, are generally placed on nonaccrual status and classified as nonperforming at 90 days past due unless repayment of the loan is insured by the Federal Housing Administration (FHA) or through individually insured long-term standby agreements with Fannie Mae (FNMA) or Freddie Mac (FHLMC) (the fully-insured portfolio). Residential mortgage loans in the fully-insured portfolio are not placed on nonaccrual status and, therefore, are not reported as nonperforming. Junior-lien home equity loans are placed on nonaccrual status and classified as nonperforming when the underlying first-lien mortgage loan becomes 90 days past due even if the junior-lien loan is current. The outstanding balance of real estate-secured loans that is in excess of the estimated property value less costs to sell is charged off no later than the end of the month in which the loan becomes 180 days past due unless the loan is fully insured, or for loans in bankruptcy, within

60 days of receipt of notification of filing, with the remaining balance classified as nonperforming.

Consumer loans secured by personal property, credit card loans and other unsecured consumer loans are not placed on nonaccrual status prior to charge-off and, therefore, are not reported as nonperforming loans, except for certain secured consumer loans, including those that have been modified in a TDR. Personal property-secured loans (including auto loans) are charged off to collateral value no later than the end of the month in which the account becomes 120 days past due, or upon repossession of an auto or, for loans in bankruptcy, within 60 days of receipt of notification of filing. Credit card and other unsecured customer loans are charged off no later than the end of the month in which the account becomes 180 days past due, within 60 days after receipt of notification of death or bankruptcy, or upon confirmation of fraud.

Commercial loans and leases, excluding business card loans, that are past due 90 days or more as to principal or interest, or where reasonable doubt exists as to timely collection, including loans that are individually identified as being impaired, are generally placed on nonaccrual status and classified as nonperforming unless well-secured and in the process of collection.

Business card loans are charged off in the same manner as consumer credit card loans. These loans are not placed on nonaccrual status prior to charge-off and, therefore, are not reported as nonperforming loans. Other commercial loans and leases are generally charged off when all or a portion of the principal amount is determined to be uncollectible.

The entire balance of a consumer loan or commercial loan or lease is contractually delinquent if the minimum payment is not received by the specified due date on the customer's billing statement. Interest and fees continue to accrue on past due loans and leases until the date the loan is placed on nonaccrual status, if applicable. Accrued interest receivable is reversed when loans and leases are placed on nonaccrual status. Interest collections on nonaccruing loans and leases for which the ultimate collectability of principal is uncertain are applied as principal reductions; otherwise, such collections are credited to income when received. Loans and leases may be restored to accrual status when all principal and interest is current and full repayment of the remaining contractual principal and interest is expected.

PCI loans are recorded at fair value at the acquisition date. Although the PCI loans may be contractually delinquent, the Corporation does not classify these loans as nonperforming as the loans were written down to fair value at the acquisition date and the accretable yield is recognized in interest income over the remaining life of the loan. In addition, reported net charge-offs exclude write-offs on PCI loans as the fair value already considers the estimated credit losses.

Troubled Debt Restructurings

Consumer and commercial loans and leases whose contractual terms have been restructured in a manner that grants a concession to a borrower experiencing financial difficulties are classified as TDRs. Concessions could include a reduction in the interest rate to a rate that is below market on the loan, payment extensions, forgiveness of principal, forbearance or other actions designed to maximize collections. Loans that are carried at fair value, LHFS and PCI loans are not classified as TDRs.

Loans and leases whose contractual terms have been modified in a TDR and are current at the time of restructuring may remain on accrual status if there is demonstrated performance prior to the restructuring and payment in full under the restructured terms is expected. Otherwise, the loans are placed on nonaccrual status and reported as nonperforming, except for fully-insured consumer real estate loans, until there is sustained repayment performance for a reasonable period, generally six months. If accruing TDRs cease to perform in accordance with their modified contractual terms, they are placed on nonaccrual status and reported as nonperforming TDRs.

Secured consumer loans that have been discharged in Chapter 7 bankruptcy and have not been reaffirmed by the borrower are classified as TDRs at the time of discharge. Such loans are placed on nonaccrual status and written down to the estimated collateral value less costs to sell no later than at the time of discharge. If these loans are contractually current, interest collections are generally recorded in interest income on a cash basis. Consumer real estate-secured loans for which a binding offer to restructure has been extended are also classified as TDRs. Credit card and other unsecured consumer loans that have been renegotiated in a TDR generally remain on accrual status until the loan is either paid in full or charged off, which occurs no later than the end of the month in which the loan becomes 180 days past due or, for loans that have been placed on a fixed payment plan, 120 days past due.

A loan that had previously been modified in a TDR and is subsequently refinanced under current underwriting standards at a market rate with no concessionary terms is accounted for as a new loan and is no longer reported as a TDR.

Loans Held-for-sale

Loans that are intended to be sold in the foreseeable future, including residential mortgages, loan syndications, and to a lesser degree, commercial real estate, consumer finance and other loans, are reported as LHFS and are carried at the lower of aggregate cost or fair value. The Corporation accounts for certain LHFS, including residential mortgage LHFS, under the fair value option. Loan origination costs related to LHFS that the Corporation accounts for under the fair value option are recognized in noninterest expense when incurred. Loan origination costs for LHFS carried at the lower of cost or fair value are capitalized as part of the carrying value of the loans and recognized as a reduction of noninterest income upon the sale of such loans. LHFS that are on nonaccrual status and are reported as nonperforming, as defined in the policy herein, are reported separately from nonperforming loans and leases.

Premises and Equipment

Premises and equipment are carried at cost less accumulated depreciation and amortization. Depreciation and amortization are recognized using the straight-line method over the estimated useful lives of the assets. Estimated lives range up to 40 years for buildings, up to 12 years for furniture and equipment, and the shorter of lease term or estimated useful life for leasehold improvements.

Goodwill and Intangible Assets

Goodwill is the purchase premium after adjusting for the fair value of net assets acquired. Goodwill is not amortized but is reviewed for potential impairment on an annual basis, or when events or circumstances indicate a potential impairment, at the reporting unit level. A reporting unit is a business segment or one level below a business segment.

The Corporation assesses the fair value of each reporting unit against its carrying value, including goodwill, as measured by allocated equity. For purposes of goodwill impairment testing, the Corporation utilizes allocated equity as a proxy for the carrying value of its reporting units. Allocated equity in the reporting units

is comprised of allocated capital plus capital for the portion of goodwill and intangibles specifically assigned to the reporting unit.

In performing its goodwill impairment testing, the Corporation first assesses qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value. Qualitative factors include, among other things, macroeconomic conditions, industry and market considerations, financial performance of the respective reporting unit and other relevant entity- and reporting-unit specific considerations. If the Corporation concludes it is more likely than not that the fair value of a reporting unit is less than its carrying value, a quantitative assessment is performed. If the fair value of the reporting unit exceeds its carrying value, goodwill of the reporting unit is considered not impaired; however, if the carrying value of the reporting unit exceeds its fair value, an additional step is performed to measure potential impairment.

This step involves calculating an implied fair value of goodwill which is the excess of the fair value of the reporting unit, as determined in the first step, over the aggregate fair values of the assets, liabilities and identifiable intangibles as if the reporting unit was being acquired in a business combination. If the implied fair value of goodwill exceeds the goodwill assigned to the reporting unit, there is no impairment. If the goodwill assigned to a reporting unit exceeds the implied fair value of goodwill, an impairment charge is recorded for the excess. An impairment loss recognized cannot exceed the amount of goodwill assigned to a reporting unit. An impairment loss establishes a new basis in the goodwill, and subsequent reversals of goodwill impairment losses are not permitted under applicable accounting guidance.

For intangible assets subject to amortization, an impairment loss is recognized if the carrying value of the intangible asset is not recoverable and exceeds fair value. The carrying value of the intangible asset is considered not recoverable if it exceeds the sum of the undiscounted cash flows expected to result from the use of the asset. Intangible assets deemed to have indefinite useful lives are not subject to amortization. An impairment loss is recognized if the carrying value of the intangible asset with an indefinite life exceeds its fair value.

Variable Interest Entities

A VIE is an entity that lacks equity investors or whose equity investors do not have a controlling financial interest in the entity through their equity investments. The Corporation consolidates a VIE if it has both the power to direct the activities of the VIE that most significantly impact the VIE’s economic performance and an obligation to absorb losses or the right to receive benefits that could potentially be significant to the VIE. On a quarterly basis, the Corporation reassesses its involvement with the VIE and evaluates the impact of changes in governing documents and its financial interests in the VIE. The consolidation status of the VIEs with which the Corporation is involved may change as a result of such reassessments.

The Corporation primarily uses VIEs for its securitization activities, in which the Corporation transfers whole loans or debt securities into a trust or other vehicle. When the Corporation is the servicer of whole loans held in a securitization trust, including non-agency residential mortgages, home equity loans, credit cards, and other loans, the Corporation has the power to direct the most significant activities of the trust. The Corporation generally does not have the power to direct the most significant activities of a residential mortgage agency trust except in certain circumstances in which the Corporation holds substantially all of the issued securities and has the unilateral right to liquidate the trust. The power to direct the most significant activities of a commercial mortgage securitization trust is typically held by the special servicer or by the party holding specific subordinate securities which embody certain controlling rights. The Corporation consolidates a whole-loan securitization trust if it has the power to direct the most significant activities and also holds securities issued by the trust or has other contractual arrangements, other than standard representations and warranties, that could potentially be significant to the trust.

The Corporation may also transfer trading account securities and AFS securities into municipal bond or resecuritization trusts. The Corporation consolidates a municipal bond or resecuritization trust if it has control over the ongoing activities of the trust such as the remarketing of the trust's liabilities or, if there are no ongoing activities, sole discretion over the design of the trust, including the identification of securities to be transferred in and the structure of securities to be issued, and also retains securities or has liquidity or other commitments that could potentially be significant to the trust. The Corporation does not consolidate a municipal bond or resecuritization trust if one or a limited number of third-party investors share responsibility for the design of the trust or have control over the significant activities of the trust through liquidation or other substantive rights.

Other VIEs used by the Corporation include collateralized debt obligations (CDOs), investment vehicles created on behalf of customers and other investment vehicles. The Corporation does not routinely serve as collateral manager for CDOs and, therefore, does not typically have the power to direct the activities that most significantly impact the economic performance of a CDO. However, following an event of default, if the Corporation is a majority holder of senior securities issued by a CDO and acquires the power to manage its assets, the Corporation consolidates the CDO.

The Corporation consolidates a customer or other investment vehicle if it has control over the initial design of the vehicle or manages the assets in the vehicle and also absorbs potentially significant gains or losses through an investment in the vehicle, derivative contracts or other arrangements. The Corporation does not consolidate an investment vehicle if a single investor controlled the initial design of the vehicle or manages the assets in the vehicles or if the Corporation does not have a variable interest that could potentially be significant to the vehicle.

Retained interests in securitized assets are initially recorded at fair value. In addition, the Corporation may invest in debt securities issued by unconsolidated VIEs. Fair values of these debt securities, which are classified as trading account assets, debt securities carried at fair value or HTM securities, are based primarily on quoted market prices in active or inactive markets. Generally, quoted market prices for retained residual interests are not available; therefore, the Corporation estimates fair values based on the present value of the associated expected future cash flows.

Fair Value

The Corporation measures the fair values of its assets and liabilities, where applicable, in accordance with accounting guidance that requires an entity to base fair value on exit price. Under this guidance, an entity is required to maximize the use of observable inputs and minimize the use of unobservable inputs in measuring fair value. A hierarchy is established which categorizes fair value measurements into three levels based on the inputs to the valuation technique with the highest priority given to unadjusted quoted prices in active markets and the lowest priority given to unobservable inputs. The Corporation categorizes its fair value measurements of financial instruments based on this three-level hierarchy.

Level 1	Unadjusted quoted prices in active markets for identical assets or liabilities. Level 1 assets and liabilities include debt and equity securities and derivative contracts that are traded in an active exchange market, as well as certain U.S. Treasury securities that are highly liquid and are actively traded in OTC markets.
Level 2	Observable inputs other than Level 1 prices, such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities. Level 2 assets and liabilities include debt securities with quoted prices that are traded less frequently than exchange-traded instruments and derivative contracts where fair value is determined using a pricing model with inputs that are observable in the market or can be derived principally from or corroborated by observable market data. This category generally includes U.S. government and agency mortgage-backed (MBS) and asset-backed securities (ABS), corporate debt securities, derivative contracts, certain loans and LHFS.
Level 3	Unobservable inputs that are supported by little or no market activity and that are significant to the overall fair value of the assets or liabilities. Level 3 assets and liabilities include financial instruments for which the determination of fair value requires significant management judgment or estimation. The fair value for such assets and liabilities is generally determined using pricing models, discounted cash flow methodologies or similar techniques that incorporate the assumptions a market participant would use in pricing the asset or liability. This category generally includes retained residual interests in securitizations, consumer MSRs, certain ABS, highly structured, complex or long-dated derivative contracts, certain loans and LHFS, IRLCs and certain CDOs where independent pricing information cannot be obtained for a significant portion of the underlying assets.

Income Taxes

There are two components of income tax expense: current and deferred. Current income tax expense reflects taxes to be paid or refunded for the current period. Deferred income tax expense results from changes in deferred tax assets and liabilities between periods. These gross deferred tax assets and liabilities represent decreases or increases in taxes expected to be paid in the future because of future reversals of temporary differences in the bases of assets and liabilities as measured by tax laws and their bases as reported in the financial statements. Deferred tax assets are also recognized for tax attributes such as net operating loss carryforwards and tax credit carryforwards. Valuation allowances are recorded to reduce deferred tax assets to the amounts management concludes are more likely than not to be realized.

Income tax benefits are recognized and measured based upon a two-step model: first, a tax position must be more likely than not to be sustained based solely on its technical merits in order to be recognized, and second, the benefit is measured as the largest dollar amount of that position that is more likely than not to be sustained upon settlement. The difference between the benefit recognized and the tax benefit claimed on a tax return is referred to as an unrecognized tax benefit. The Corporation records income tax-related interest and penalties, if applicable, within income tax expense.

Revenue Recognition

The following summarizes the Corporation's revenue recognition accounting policies for certain noninterest income activities.

Card Income

Card income includes annual, late and over-limit fees as well as fees earned from interchange, cash advances and other miscellaneous transactions and is presented net of direct costs. Interchange fees are recognized upon settlement of the credit and debit card payment transactions and are generally determined on a percentage basis for credit cards and fixed rates for debit cards based on the corresponding payment network's rates. Substantially all card fees are recognized at the transaction date, except for certain time-based fees such as annual fees, which are recognized over 12 months. Fees charged to cardholders that are estimated to be uncollectible are reserved in the allowance for loan and lease losses. Included in direct cost are rewards and credit card partner payments. Rewards paid to cardholders are related to points earned by the cardholder that can be redeemed for a broad range of rewards including cash, travel and gift cards. The points to be redeemed are estimated based on past redemption behavior, card product type, account transaction activity and other historical card performance. The liability is reduced as the points are redeemed. The Corporation also makes payments to credit card partners. The payments are based on revenue-sharing agreements that are generally driven by cardholder transactions and partner sales volumes. As part of the revenue-sharing agreements, the credit card partner provides the Corporation exclusive rights to market to the credit card partner's members or customers on behalf of the Corporation.

Service Charges

Service charges include deposit and lending-related fees. Deposit-related fees consist of fees earned on consumer and commercial deposit activities and are generally recognized when the transactions occur or as the service is performed. Consumer fees are earned on consumer deposit accounts for account maintenance and various transaction-based services, such as ATM transactions, wire transfer activities, check and money order processing and insufficient funds/overdraft transactions. Commercial deposit-related fees are from the Corporation's Global Transaction Services business and consist of commercial deposit and treasury management services, including account maintenance and other services, such as payroll, sweep account and other cash management services. Lending-related fees generally represent transactional fees earned from certain loan commitments, financial guarantees and SBLCs.

Investment and Brokerage Services

Investment and brokerage services consist of asset management and brokerage fees. Asset management fees are earned from the management of client assets under advisory agreements or the full discretion of the Corporation's financial advisors (collectively referred to as assets under management (AUM)). Asset management fees are earned as a percentage of the client's AUM and generally range from50 basis points (bps) to 150 bps of the AUM. In cases where a third party is used to obtain a client's investment allocation, the fee remitted to the third party is recorded net and is not reflected in the transaction price, as the Corporation is an agent for those services. Brokerage fees include income earned from transaction-based services that are performed as part of investment management services and are based on a fixed price per unit or as a percentage of the total transaction amount. Brokerage fees also include distribution fees and sales commissions that are primarily in the

Global Wealth & Investment Management (*GWIM*) segment and are earned over time. In addition, primarily in the *Global Markets* segment, brokerage fees are earned when the Corporation fills customer orders to buy or sell various financial products or when it acknowledges, affirms, settles and clears transactions and/or submits trade information to the appropriate clearing broker. Certain customers pay brokerage, clearing and/or exchange fees imposed by relevant regulatory bodies or exchanges in order to execute or clear trades. These fees are recorded net and are not reflected in the transaction price, as the Corporation is an agent for those services.

Investment Banking Income

Investment banking income includes underwriting income and financial advisory services income. Underwriting consists of fees earned for the placement of a customer's debt or equity securities. The revenue is generally earned based on a percentage of the fixed number of shares or principal placed. Once the number of shares or notes is determined and the service is completed, the underwriting fees are recognized. The Corporation incurs certain out-of-pocket expenses, such as legal costs, in performing these services. These expenses are recovered through the revenue the Corporation earns from the customer and are included in operating expenses. Syndication fees represent fees earned as the agent or lead lender responsible for structuring, arranging and administering a loan syndication.

Financial advisory services consist of fees earned for assisting customers with transactions related to mergers and acquisitions and financial restructurings. Revenue varies depending on the size and number of services performed for each contract and is generally contingent on successful execution of the transaction. Revenue is typically recognized once the transaction is completed and all services have been rendered. Additionally, the Corporation may earn a fixed fee in merger and acquisition transactions to provide a fairness opinion, with the fees recognized when the opinion is delivered to the customer.

Other Revenue Measurement and Recognition Policies

The Corporation did not disclose the value of any open performance obligations at December 31, 2018, as its contracts with customers generally have a fixed term that is less than one year, an open term with a cancellation period that is less than one year, or provisions that allow the Corporation to recognize revenue at the amount it has the right to invoice.

Earnings Per Common Share

Earnings per common share (EPS) is computed by dividing net income allocated to common shareholders by the weighted-average common shares outstanding, excluding unvested common shares subject to repurchase or cancellation. Net income allocated to common shareholders is net income adjusted for preferred stock dividends including dividends declared, accretion of discounts on preferred stock including accelerated accretion when preferred stock is repaid early, and cumulative dividends related to the current dividend period that have not been declared as of period end, less income allocated to participating securities. Diluted EPS is computed by dividing income allocated to common shareholders plus dividends on dilutive convertible preferred stock and preferred stock that can be tendered to exercise warrants, by the weighted-average common shares outstanding plus amounts representing the dilutive effect of stock options outstanding, restricted stock, restricted stock units (RSUs), outstanding warrants and the dilution resulting from the conversion of convertible preferred stock, if applicable.

Foreign Currency Translation

Assets, liabilities and operations of foreign branches and subsidiaries are recorded based on the functional currency of each entity. When the functional currency of a foreign operation is the local currency, the assets, liabilities and operations are translated, for consolidation purposes, from the local currency to the U.S. dollar reporting currency at period-end rates for assets and

liabilities and generally at average rates for results of operations. The resulting unrealized gains and losses are reported as a component of accumulated OCI, net-of-tax. When the foreign entity's functional currency is the U.S. dollar, the resulting remeasurement gains or losses on foreign currency-denominated assets or liabilities are included in earnings.

NOTE 2 Noninterest Income

The table below presents the Corporation's noninterest income disaggregated by revenue source for2018, 2017 and 2016. For more information, see *Note 1 – Summary of Significant Accounting Principles*.For a disaggregation of noninterest income by business segment and *All Other*, see *Note 23 – Business Segment Information*.

(Dollars in millions)	**2018**	2017	2016
Card income			
Interchange fees [1]	**$ 4,093**	$ 3,942	$ 3,960
Other card income	**1,958**	1,960	1,891
Total card income	**6,051**	5,902	5,851
Service charges			
Deposit-related fees	**6,667**	6,708	6,545
Lending-related fees	**1,100**	1,110	1,093
Total service charges	**7,767**	7,818	7,638
Investment and brokerage services			
Asset management fees	**10,189**	9,310	8,328
Brokerage fees	**3,971**	4,526	5,021
Total investment and brokerage services	**14,160**	13,836	13,349
Investment banking income			
Underwriting income	**2,722**	2,821	2,585
Syndication fees	**1,347**	1,499	1,388
Financial advisory services	**1,258**	1,691	1,268
Total investment banking income	**5,327**	6,011	5,241
Trading account profits	**8,540**	7,277	6,902
Other income	**1,970**	1,841	3,624
Total noninterest income	**$ 43,815**	$ 42,685	$ 42,605

(1) During 2018, 2017 and 2016, gross interchange fees were $9.5 billion, $8.8 billion and $8.2 billion and are presented net of $5.4 billion, $4.8 billion and $4.2 billion, respectively, of expenses for rewards and partner payments.

NOTE 3 Derivatives

Derivative Balances

Derivatives are entered into on behalf of customers, for trading or to support risk management activities. Derivatives used in risk management activities include derivatives that may or may not be designated in qualifying hedge accounting relationships. Derivatives that are not designated in qualifying hedge accounting relationships are referred to as other risk management derivatives. For more information on the Corporation's derivatives and hedging

activities, see *Note 1 – Summary of Significant Accounting Principles*.The following tables present derivative instruments included on the Consolidated Balance Sheet in derivative assets and liabilities at December 31, 2018 and 2017. Balances are presented on a gross basis, prior to the application of counterparty and cash collateral netting. Total derivative assets and liabilities are adjusted on an aggregate basis to take into consideration the effects of legally enforceable master netting agreements and have been reduced by cash collateral received or paid.

		December 31, 2018					
		Gross Derivative Assets			**Gross Derivative Liabilities**		
(Dollars in billions)	**Contract/ Notional [1]**	**Trading and Other Risk Management Derivatives**	**Qualifying Accounting Hedges**	**Total**	**Trading and Other Risk Management Derivatives**	**Qualifying Accounting Hedges**	**Total**
Interest rate contracts							
Swaps	**$ 15,977.9**	**$ 141.0**	**$ 3.2**	**$ 144.2**	**$ 138.9**	**$ 2.0**	**$ 140.9**
Futures and forwards	**3,656.6**	**4.7**	**—**	**4.7**	**5.0**	**—**	**5.0**
Written options	**1,584.9**	**—**	**—**	**—**	**28.6**	**—**	**28.6**
Purchased options	**1,614.0**	**30.8**	**—**	**30.8**	**—**	**—**	**—**
Foreign exchange contracts							
Swaps	**1,704.8**	**38.8**	**1.4**	**40.2**	**42.2**	**2.3**	**44.5**
Spot, futures and forwards	**4,276.0**	**39.8**	**0.4**	**40.2**	**39.3**	**0.3**	**39.6**
Written options	**256.7**	**—**	**—**	**—**	**5.0**	**—**	**5.0**
Purchased options	**240.4**	**4.6**	**—**	**4.6**	**—**	**—**	**—**
Equity contracts							
Swaps	**253.6**	**7.7**	**—**	**7.7**	**8.4**	**—**	**8.4**
Futures and forwards	**100.0**	**2.1**	**—**	**2.1**	**0.3**	**—**	**0.3**
Written options	**597.1**	**—**	**—**	**—**	**27.5**	**—**	**27.5**
Purchased options	**549.4**	**36.0**	**—**	**36.0**	**—**	**—**	**—**
Commodity contracts							
Swaps	**43.1**	**2.7**	**—**	**2.7**	**4.5**	**—**	**4.5**
Futures and forwards	**51.7**	**3.2**	**—**	**3.2**	**0.5**	**—**	**0.5**
Written options	**27.5**	**—**	**—**	**—**	**2.2**	**—**	**2.2**
Purchased options	**23.4**	**1.7**	**—**	**1.7**	**—**	**—**	**—**
Credit derivatives [2, 3]							
Purchased credit derivatives:							
Credit default swaps	**408.1**	**5.3**	**—**	**5.3**	**4.9**	**—**	**4.9**
Total return swaps/options	**84.5**	**0.4**	**—**	**0.4**	**1.0**	**—**	**1.0**
Written credit derivatives:							
Credit default swaps	**371.9**	**4.4**	**—**	**4.4**	**4.3**	**—**	**4.3**
Total return swaps/options	**87.3**	**0.6**	**—**	**0.6**	**0.6**	**—**	**0.6**
Gross derivative assets/liabilities		**$ 323.8**	**$ 5.0**	**$ 328.8**	**$ 313.2**	**$ 4.6**	**$ 317.8**
Less: Legally enforceable master netting agreements				**(252.7)**			**(252.7)**

Less: Cash collateral received/paid	**(32.4)**	**(27.2)**
Total derivative assets/liabilities	**$ 43.7**	**$ 37.9**

(1) Represents the total contract/notional amount of derivative assets and liabilities outstanding.

(2) The net derivative liability and notional amount of written credit derivatives for which the Corporation held purchased credit derivatives with identical underlying referenced names were $185 million and $342.8 billion at December 31, 2018.

(3) Derivative assets and liabilities for credit default swaps (CDS) reflect a central clearing counterparty's amendments to legally re-characterize daily cash variation margin from collateral, which secures an outstanding exposure, to settlement, which discharges an outstanding exposure, effective in 2018.

(Dollars in billions)	Contract/ Notional (1)	December 31, 2017 Gross Derivative Assets Trading and Other Risk Management Derivatives	Qualifying Accounting Hedges	Total	Gross Derivative Liabilities Trading and Other Risk Management Derivatives	Qualifying Accounting Hedges	Total
Interest rate contracts							
Swaps	$ 15,416.4	$ 175.1	$ 2.9	$ 178.0	$ 172.5	$ 1.7	$ 174.2
Futures and forwards	4,332.4	0.5	—	0.5	0.5	—	0.5
Written options	1,170.5	—	—	—	35.5	—	35.5
Purchased options	1,184.5	37.6	—	37.6	—	—	—
Foreign exchange contracts							
Swaps	2,011.1	35.6	2.2	37.8	36.1	2.7	38.8
Spot, futures and forwards	3,543.3	39.1	0.7	39.8	39.1	0.8	39.9
Written options	291.8	—	—	—	5.1	—	5.1
Purchased options	271.9	4.6	—	4.6	—	—	—
Equity contracts							
Swaps	265.6	4.8	—	4.8	4.4	—	4.4
Futures and forwards	106.9	1.5	—	1.5	0.9	—	0.9
Written options	480.8	—	—	—	23.9	—	23.9
Purchased options	428.2	24.7	—	24.7	—	—	—
Commodity contracts							
Swaps	46.1	1.8	—	1.8	4.6	—	4.6
Futures and forwards	47.1	3.5	—	3.5	0.6	—	0.6
Written options	21.7	—	—	—	1.4	—	1.4
Purchased options	22.9	1.4	—	1.4	—	—	—
Credit derivatives (2)							
Purchased credit derivatives:							
Credit default swaps	470.9	4.1	—	4.1	11.1	—	11.1
Total return swaps/options	54.1	0.1	—	0.1	1.3	—	1.3
Written credit derivatives:							
Credit default swaps	448.2	10.6	—	10.6	3.6	—	3.6
Total return swaps/options	55.2	0.8	—	0.8	0.2	—	0.2
Gross derivative assets/liabilities		$ 345.8	$ 5.8	$ 351.6	$ 340.8	$ 5.2	$ 346.0
Less: Legally enforceable master netting agreements				(279.2)			(279.2)
Less: Cash collateral received/paid				(34.6)			(32.5)
Total derivative assets/liabilities				$ 37.8			$ 34.3

(1) Represents the total contract/notional amount of derivative assets and liabilities outstanding.
(2) The net derivative asset and notional amount of written credit derivatives for which the Corporation held purchased credit derivatives with identical underlying referenced names were $6.4 billion and $435.1 billion at December 31, 2017.

Offsetting of Derivatives

The Corporation enters into International Swaps and Derivatives Association, Inc. (ISDA) master netting agreements or similar agreements with substantially all of the Corporation's derivative counterparties. Where legally enforceable, these master netting agreements give the Corporation, in the event of default by the counterparty, the right to liquidate securities held as collateral and to offset receivables and payables with the same counterparty. For purposes of the Consolidated Balance Sheet, the Corporation offsets derivative assets and liabilities and cash collateral held with the same counterparty where it has such a legally enforceable master netting agreement.

The following table presents derivative instruments included in derivative assets and liabilities on the Consolidated Ba lance Sheet at December 31, 2018 and 2017 by primary risk (e.g., interest rate risk) and the platform, where applicable, on which these derivatives are transacted. Balances are presented on a gross basis, prior to the application of counterparty and cash collateral netting. Total gross derivative assets and liabilities are adjusted on an aggregate basis to take into consideration the effects of legally enforceable master netting agreements which include reducing the balance for counterparty netting and cash collateral received or paid.

For more information on offsetting of securities financing agreements, see *Note 10 – Federal Funds Sold or Purchased, Securities Financing Agreements, Short-term Borrowings and Restricted Cash*.

Offsetting of Derivatives [1]

(Dollars in billions)	**Derivative Assets**	**Derivative Liabilities**	Derivative Assets	Derivative Liabilities
	December 31, 2018		December 31, 2017	
Interest rate contracts				
Over-the-counter	**$ 174.2**	**$ 169.4**	$ 211.7	$ 206.0
Over-the-counter cleared	**4.8**	**4.0**	1.9	1.8
Foreign exchange contracts				
Over-the-counter	**82.5**	**86.3**	78.7	80.8
Over-the-counter cleared	**0.9**	**0.9**	0.9	0.7
Equity contracts				
Over-the-counter	**24.6**	**14.6**	18.3	16.2
Exchange-traded	**16.1**	**15.1**	9.1	8.5
Commodity contracts				
Over-the-counter	**3.5**	**4.5**	2.9	4.4
Exchange-traded	**1.0**	**0.9**	0.7	0.8
Credit derivatives				
Over-the-counter	**7.7**	**8.2**	9.1	9.6
Over-the-counter cleared	**2.5**	**2.3**	6.1	6.0
Total gross derivative assets/liabilities, before netting				
Over-the-counter	**292.5**	**283.0**	320.7	317.0
Exchange-traded	**17.1**	**16.0**	9.8	9.3
Over-the-counter cleared	**8.2**	**7.2**	8.9	8.5
Less: Legally enforceable master netting agreements and cash collateral received/paid				
Over-the-counter	**(264.4)**	**(259.2)**	(296.9)	(294.6)
Exchange-traded	**(13.5)**	**(13.5)**	(8.6)	(8.6)
Over-the-counter cleared	**(7.2)**	**(7.2)**	(8.3)	(8.5)
Derivative assets/liabilities, after netting	**32.7**	**26.3**	25.6	23.1
Other gross derivative assets/liabilities [2]	**11.0**	**11.6**	12.2	11.2
Total derivative assets/liabilities	**43.7**	**37.9**	37.8	34.3
Less: Financial instruments collateral [3]	**(16.3)**	**(8.6)**	(11.2)	(10.4)
Total net derivative assets/liabilities	**$ 27.4**	**$ 29.3**	$ 26.6	$ 23.9

(1) OTC derivatives include bilateral transactions between the Corporation and a particular counterparty. OTC-cleared derivatives include bilateral transactions between the Corporation and a counterparty where the transaction is cleared through a clearinghouse. Exchange-traded derivatives include listed options transacted on an exchange.

(2) Consists of derivatives entered into under master netting agreements where the enforceability of these agreements is uncertain under bankruptcy laws in some countries or industries.

(3) Amounts are limited to the derivative asset/liability balance and, accordingly, do not include excess collateral received/pledged. Financial instruments collateral includes securities collateral received or pledged and cash securities held and posted at third-party custodians that are not offset on the Consolidated Balance Sheet but shown as a reduction to derive net derivative assets and liabilities.

ALM and Risk Management Derivatives

The Corporation’s ALM and risk management activities include the use of derivatives to mitigate risk to the Corporation including derivatives designated in qualifying hedge accounting relationships and derivatives used in other risk management activities. Interest rate, foreign exchange, equity, commodity and credit contracts are utilized in the Corporation’s ALM and risk management activities.

The Corporation maintains an overall interest rate risk management strategy that incorporates the use of interest rate contracts, which are generally non-leveraged generic interest rate and basis swaps, options, futures and forwards, to minimize significant fluctuations in earnings caused by interest rate volatility. The Corporation’s goal is to manage interest rate sensitivity and volatility so that movements in interest rates do not significantly adversely affect earnings or capital. As a result of interest rate fluctuations, hedged fixed-rate assets and liabilities appreciate or depreciate in fair value. Gains or losses on the derivative instruments that are linked to the hedged fixed-rate assets and liabilities are expected to substantially offset this unrealized appreciation or depreciation. Market risk, including interest rate risk, can be substantial in the mortgage business. Market risk in the mortgage business is the risk that values of mortgage assets or revenues will be adversely affected by changes in market conditions such as interest rate movements. To mitigate the interest rate risk in mortgage banking production income, the Corporation utilizes forward loan sale commitments and other derivative instruments, including purchased options, and certain debt securities. The

Corporation also utilizes derivatives such as interest rate options, interest rate swaps, forward settlement contracts and eurodollar futures to hedge certain market risks of MSRs. For more information on MSRs, see *Note 20 – Fair Value Measurements*.

The Corporation uses foreign exchange contracts to manage the foreign exchange risk associated with certain foreign currency-denominated assets and liabilities, as well as the Corporation's investments in non-U.S. subsidiaries. Foreign exchange contracts, which include spot and forward contracts, represent agreements to exchange the currency of one country for the currency of another country at an agreed-upon price on an agreed-upon settlement date. Exposure to loss on these contracts will increase or decrease over their respective lives as currency exchange and interest rates fluctuate.

The Corporation purchases credit derivatives to manage credit risk related to certain funded and unfunded credit exposures. Credit derivatives include CDS, total return swaps and swaptions. These derivatives are recorded on the Consolidated Balance Sheet at fair value with changes in fair value recorded in other income.

Derivatives Designated as Accounting Hedges

The Corporation uses various types of interest rate and foreign exchange derivative contracts to protect against changes in the fair value of its assets and liabilities due to fluctuations in interest rates and exchange rates (fair value hedges). The Corporation also uses these types of contracts to protect against changes in the cash flows of its assets and liabilities, and other forecasted transactions (cash flow hedges). The Corporation hedges its net investment in consolidated non-U.S. operations determined to have functional currencies other than the U.S. dollar using forward exchange contracts and cross-currency basis swaps, and by issuing foreign currency-denominated debt (net investment hedges).

Fair Value Hedges

The table below summarizes information related to fair value hedges for 2018, 2017 and 2016.

Gains and Losses on Derivatives Designated as Fair Value Hedges

	Derivative			Hedged Item		
(Dollars in millions)	**2018**	2017	2016	**2018**	2017	2016
Interest rate risk on long-term debt [1]	**$ (1,538)**	$ (1,537)	$ (1,488)	**$ 1,429**	$ 1,045	$ 646
Interest rate and foreign currency risk on long-term debt [2]	**(1,187)**	1,811	(941)	**1,079**	(1,767)	944
Interest rate risk on available-for-sale securities [3]	**(52)**	(67)	227	**50**	35	(286)
Total	**$ (2,777)**	$ 207	$ (2,202)	**$ 2,558**	$ (687)	$ 1,304

(1) Amounts are recorded in interest expense in the Consolidated Statement of Income. In 2017 and 2016, amounts representing hedge ineffectiveness were losses of $492 million and $842 million.

(2) In 2018, 2017 and 2016, the derivative amount includes losses of $992 million, gains of $2.2 billion and losses of $910 million, respectively, in other income and losses of $116 million, $365 million and $30 million, respectively, in interest expense. Line item totals are in the Consolidated Statement of Income.

(3) Amounts are recorded in interest income in the Consolidated Statement of Income.

The table below summarizes the carrying value of hedged assets and liabilities that are designated and qualifying in fair value hedging relationships along with the cumulative amount of fair value hedging adjustments included in the carrying value that have been recorded in the current hedging relationships. These fair value hedging adjustments are open basis adjustments that are not subject to amortization as long as the hedging relationship remains designated.

Designated Fair Value Hedged Assets (Liabilities)

	December 31, 2018	
(Dollars in millions)	Carrying Value	Cumulative Fair Value Adjustments (1)
Long-term debt	$ (138,682)	$ (2,117)
Available-for-sale debt securities	981	(29)

(1) For assets, increase (decrease) to carrying value and for liabilities, (increase) decrease to carrying value.

At December 31, 2018, the cumulative fair value adjustments remaining on long-term debt and AFS debt securities from discontinued hedging relationships were a decrease to the related liability and related asset of $1.6 billion and $29 million, which are being amortized over the remaining contractual life of the de-designated hedged items.

Cash Flow and Net Investment Hedges

The following table summarizes certain information related to cash flow hedges and net investment hedges for 2018, 2017 and 2016.

Of the $1.0 billion after-tax net loss ($1.3 billion pretax) on derivatives in accumulated OCI at December 31, 2018, $253 million after-tax ($332 million pretax) is expected to be reclassified into earnings in the next 12 months. These net losses reclassified into earnings are expected to primarily reduce net interest income related to the respective hedged items. For terminated cash flow hedges, the time period over which the majority of the forecasted transactions are hedged is approximately 4 years, with a maximum length of time for certain forecasted transactions of 17 years.

Gains and Losses on Derivatives Designated as Cash Flow and Net Investment Hedges

	Gains (Losses) Recognized in Accumulated OCI on Derivatives			**Gains (Losses) in Income Reclassified from Accumulated OCI**		
(Dollars in millions, amounts pretax)	**2018**	2017	2016	**2018**	2017	2016
Cash flow hedges						
Interest rate risk on variable-rate assets [(1)]	**$(159)**	$(109)	$(340)	**$(165)**	$(327)	$(553)
Price risk on certain restricted stock awards [(2)]	**4**	59	41	**27**	148	(32)
Total	**$(155)**	$(50)	$(299)	**$(138)**	$(179)	$(585)
Net investment hedges						
Foreign exchange risk [(3)]	**$989**	$(1,588)	$1,636	**$411**	$1,782	$3

(1) Amounts reclassified from accumulated OCI are recorded in interest income in the Consolidated Statement of Income.
(2) Amounts reclassified from accumulated OCI are recorded in personnel expense in the Consolidated Statement of Income.
(3) Amounts reclassified from accumulated OCI are recorded in other income in the Consolidated Statement of Income. Amounts excluded from effectiveness testing and recognized in other income were gains of $47 million, $120 million and $325 million in 2018, 2017 and 2016, respectively.

Other Risk Management Derivatives

Other risk management derivatives are used by the Corporation to reduce certain risk exposures by economically hedging various assets and liabilities. The gains and losses on these derivatives are recognized in other income. The table below presents gains (losses) on these derivatives for 2018, 2017 and 2016. These gains (losses) are largely offset by the income or expense that is recorded on the hedged item.

Gains and Losses on Other Risk Management Derivatives

(Dollars in millions)	**2018**	2017	2016
Interest rate risk on mortgage activities (1)	**$ (107)**	$ 8	$ 461
Credit risk on loans	**9**	(6)	(107)
Interest rate and foreign currency risk on ALM activities (2)	**1,010**	(36)	(754)

(1) Primarily related to hedges of interest rate risk on MSRs and IRLCs to originate mortgage loans that will be held for sale. The net gains on IRLCs, which are not included in the table but are considered derivative instruments, were $47 million, $220 million and $533 million for 2018, 2017 and 2016, respectively.
(2) Primarily related to hedges of debt securities carried at fair value and hedges of foreign currency-denominated debt.

Transfers of Financial Assets with Risk Retained through Derivatives

The Corporation enters into certain transactions involving the transfer of financial assets that are accounted for as sales where substantially all of the economic exposure to the transferred financial assets is retained through derivatives (e.g., interest rate and/or credit), but the Corporation does not retain control over the assets transferred. As of December 31, 2018 and 2017, the Corporation had transferred $5.8 billion and $6.0 billion of non-U.S. government-guaranteed MBS to a third-party trust and retained economic exposure to the transferred assets through derivative contracts. In connection with these transfers, the Corporation received gross cash proceeds of $5.8 billion and $6.0 billion at the transfer dates. At December 31, 2018 and 2017, the fair value of the transferred securities was $5.5 billion and $6.1 billion.

Sales and Trading Revenue

The Corporation enters into trading derivatives to facilitate client transactions and to manage risk exposures arising from trading account assets and liabilities. It is the Corporation’s policy to include these derivative instruments in its trading activities which include derivatives and non-derivative cash instruments. The resulting risk from these derivatives is managed on a portfolio basis as part of the Corporation’s*Global Markets* business segment. The related sales and trading revenue generated within *Global Markets* is recorded in various income statement line items including trading account profits and net interest income as well as other revenue categories. Sales and trading revenue includes changes in the fair value and realized gains and losses on the sales of trading and other assets, net interest income, and fees primarily from commissions on equity securities. Revenue is generated by the difference in the client price for an instrument and the price at which the trading desk can execute the trade in the dealer market. For equity securities, commissions related to purchases and sales are recorded in the “Other” column in the Sales and Trading Revenue table. Changes in the fair value of these securities are included in trading account profits. For debt securities, revenue, with the exception of interest associated with the debt securities, is typically included in trading account profits. Unlike commissions for equity securities, the initial revenue related to broker-dealer services for debt securities is typically included in the pricing of

the instrument rather than being charged through separate fee arrangements. Therefore, this revenue is recorded in trading account profits as part of the initial mark to fair value. For derivatives, the majority of revenue is included in trading account profits. In transactions where the Corporation acts as agent, which include exchange-traded futures and options, fees are recorded in other income.

The table below, which includes both derivatives and non-derivative cash instruments, identifies the amounts in the respective income statement line items attributable to the Corporation’s sales and trading revenue in*Global Markets*, categorized by primary risk, for 2018, 2017 and 2016. The difference between total trading account profits in the following table and in the Consolidated Statement of Income represents trading activities in business segments other than *Global Markets*. This table includes debit valuation adjustment (DVA) and funding valuation adjustment (FVA) gains (losses). *Global Markets* results in *Note 23 – Business Segment Information* are presented on a fully taxable-equivalent (FTE) basis. The table below is not presented on an FTE basis.

Sales and Trading Revenue

(Dollars in millions)	Trading Account Profits	Net Interest Income	Other (1)	Total
	2018			
Interest rate risk	**$ 1,180**	**$ 1,292**	**$ 220**	**$ 2,692**
Foreign exchange risk	**1,503**	**(7)**	**6**	**1,502**
Equity risk	**3,994**	**(781)**	**1,619**	**4,832**
Credit risk	**1,063**	**1,853**	**552**	**3,468**
Other risk	**189**	**64**	**66**	**319**
Total sales and trading revenue	**$ 7,929**	**$ 2,421**	**$ 2,463**	**$ 12,813**
	2017			
Interest rate risk	$ 712	$ 1,560	$ 249	$ 2,521
Foreign exchange risk	1,417	(1)	7	1,423
Equity risk	2,689	(517)	1,903	4,075
Credit risk	1,685	1,937	576	4,198
Other risk	203	45	76	324
Total sales and trading revenue	$ 6,706	$ 3,024	$ 2,811	$ 12,541
	2016			
Interest rate risk	$ 1,189	$ 2,002	$ 145	$ 3,336
Foreign exchange risk	1,360	(10)	5	1,355
Equity risk	1,917	28	2,074	4,019
Credit risk	1,674	1,956	424	4,054
Other risk	407	(7)	39	439
Total sales and trading revenue	$ 6,547	$ 3,969	$ 2,687	$ 13,203

(1) Represents amounts in investment and brokerage services and other income that are recorded in *Global Markets* and included in the definition of sales and trading revenue. Includes investment and brokerage services revenue of $1.7 billion, $2.0 billion and $2.1 billion for 2018, 2017 and 2016, respectively.

Credit Derivatives

The Corporation enters into credit derivatives primarily to facilitate client transactions and to manage credit risk exposures. Credit derivatives derive value based on an underlying third-party referenced obligation or a portfolio of referenced obligations and generally require the Corporation, as the seller of credit protection, to make payments to a buyer upon the occurrence of a predefined credit event. Such credit events generally include bankruptcy of the referenced credit entity and failure to pay under the obligation, as well as acceleration of indebtedness and payment repudiation or moratorium. For credit derivatives based on a portfolio of referenced credits or credit indices, the Corporation may not be required to make payment until a specified amount of loss has occurred and/or may only be required to make payment up to a specified amount.

Credit derivatives are classified as investment and non-investment grade based on the credit quality of the underlying referenced obligation. The Corporation considers ratings of BBB- or higher as investment grade. Non-investment grade includes non-rated credit derivative instruments. The Corporation discloses

internal categorizations of investment grade and non-investment grade consistent with how risk is managed for these instruments.
Credit derivative instruments where the Corporation is the seller of credit protection and their expiration at December 31, 2018 and 2017 are summarized in the following table.

Credit Derivative Instruments

	Less than One Year	One to Three Years	Three to Five Years	Over Five Years	Total
	December 31, 2018				
(Dollars in millions)	**Carrying Value**				
Credit default swaps:					
Investment grade	**$2**	**$44**	**$436**	**$488**	**$970**
Non-investment grade	**132**	**636**	**914**	**1,691**	**3,373**
Total	**134**	**680**	**1,350**	**2,179**	**4,343**
Total return swaps/options:					
Investment grade	**105**	**—**	**—**	**—**	**105**
Non-investment grade	**472**	**21**	**—**	**—**	**493**
Total	**577**	**21**	**—**	**—**	**598**
Total credit derivatives	**$711**	**$701**	**$1,350**	**$2,179**	**$4,941**
Credit-related notes:					
Investment grade	**$—**	**$—**	**$4**	**$532**	**$536**
Non-investment grade	**1**	**1**	**1**	**1,500**	**1,503**
Total credit-related notes	**$1**	**$1**	**$5**	**$2,032**	**$2,039**
	Maximum Payout/Notional				
Credit default swaps:					
Investment grade	**$53,758**	**$95,699**	**$95,274**	**$20,054**	**$264,785**
Non-investment grade	**24,297**	**33,881**	**34,530**	**14,426**	**107,134**
Total	**78,055**	**129,580**	**129,804**	**34,480**	**371,919**
Total return swaps/options:					
Investment grade	**60,042**	**822**	**59**	**72**	**60,995**
Non-investment grade	**24,524**	**1,649**	**39**	**70**	**26,282**
Total	**84,566**	**2,471**	**98**	**142**	**87,277**
Total credit derivatives	**$162,621**	**$132,051**	**$129,902**	**$34,622**	**$459,196**
	December 31, 2017				
	Carrying Value				
Credit default swaps:					
Investment grade	$4	$3	$61	$245	$313
Non-investment grade	203	453	484	2,133	3,273
Total	207	456	545	2,378	3,586
Total return swaps/options:					
Investment grade	30	—	—	—	30
Non-investment grade	150	—	—	3	153
Total	180	—	—	3	183
Total credit derivatives	$387	$456	$545	$2,381	$3,769
Credit-related notes:					

Investment grade	$ —	$ —	$ 7	$ 689	$ 696
Non-investment grade	12	4	34	1,548	1,598
Total credit-related notes	$ 12	$ 4	$ 41	$ 2,237	$ 2,294
	Maximum Payout/Notional				
Credit default swaps:					
Investment grade	$ 61,388	$ 115,480	$ 107,081	$ 21,579	$ 305,528
Non-investment grade	39,312	49,843	39,098	14,420	142,673
Total	100,700	165,323	146,179	35,999	448,201
Total return swaps/options:					
Investment grade	37,394	2,581	—	143	40,118
Non-investment grade	13,751	514	143	697	15,105
Total	51,145	3,095	143	840	55,223
Total credit derivatives	$ 151,845	$ 168,418	$ 146,322	$ 36,839	$ 503,424

The notional amount represents the maximum amount payable by the Corporation for most credit derivatives. However, the Corporation does not monitor its exposure to credit derivatives based solely on the notional amount because this measure does not take into consideration the probability of occurrence. As such, the notional amount is not a reliable indicator of the Corporation’s exposure to these contracts. Instead, a risk framework is used to define risk tolerances and establish limits so that certain credit risk-related losses occur within acceptable, predefined limits.

Credit-related notes in the table above include investments in securities issued by CDO, collateralized loan obligation (CLO) and credit-linked note vehicles. These instruments are primarily classified as trading securities. The carrying value of these instruments equals the Corporation’s maximum exposure to loss. The Corporation is not obligated to make any payments to the entities under the terms of the securities owned.

Credit-related Contingent Features and Collateral

The Corporation executes the majority of its derivative contracts in the OTC market with large, international financial institutions, including broker-dealers and, to a lesser degree, with a variety of non-financial companies. A significant majority of the derivative transactions are executed on a daily margin basis. Therefore, events such as a credit rating downgrade (depending on the ultimate rating level) or a breach of credit covenants would typically require an increase in the amount of collateral required of the counterparty, where applicable, and/or allow the Corporation to take additional protective measures such as early termination of all trades. Further, as previously discussed on page 102, the Corporation enters into legally enforceable master netting agreements which reduce risk by permitting closeout and netting of transactions with the same counterparty upon the occurrence of certain events.

A majority of the Corporation’s derivative contracts contain credit risk-related contingent features, primarily in the form of ISDA master netting agreements and credit support documentation that enhance the creditworthiness of these instruments compared to other obligations of the respective counterparty with whom the Corporation has transacted. These contingent features may be for the benefit of the Corporation as well as its counterparties with respect to changes in the Corporation’s creditworthiness and the mark-to-market exposure under the derivative transactions. At December 31, 2018 and 2017, the Corporation held cash and securities collateral of $81.6 billion and $77.2 billion, and posted cash and securities collateral of $56.5 billion and $59.2 billion in the normal course of business under derivative agreements, excluding cross-product margining agreements where clients are permitted to margin on a net basis for both derivative and secured financing arrangements.

In connection with certain OTC derivative contracts and other trading agreements, the Corporation can be required to provide additional collateral or to terminate transactions with certain counterparties in the event of a downgrade of the senior debt ratings of the Corporation or certain subsidiaries. The amount of additional collateral required depends on the contract and is usually a fixed incremental amount and/or the market value of the exposure.

At December 31, 2018, the amount of collateral, calculated based on the terms of the contracts, that the Corporation and certain subsidiaries could be required to post to counterparties but had not yet posted to counterparties was $1.8 billion, including $1.0 billion for Bank of America, National Association (Bank of America, N.A. or BANA).

Some counterparties are currently able to unilaterally terminate certain contracts, or the Corporation or certain subsidiaries may be required to take other action such as find a suitable replacement or obtain a guarantee. At December 31, 2018 and 2017, the liability recorded for these derivative contracts was not significant.

The table below presents the amount of additional collateral that would have been contractually required by derivative contracts and other trading agreements at December 31, 2018 if the rating agencies had downgraded their long-term senior debt ratings for the Corporation or certain subsidiaries by one incremental notch and by an additional second incremental notch.

Additional Collateral Required to be Posted Upon Downgrade at December 31, 2018

(Dollars in millions)	**One incremental notch**	**Second incremental notch**
Bank of America Corporation	$ 619	$ 347
Bank of America, N.A. and subsidiaries [1]	209	268

(1) Included in Bank of America Corporation collateral requirements in this table.

The following table presents the derivative liabilities that would be subject to unilateral termination by counterparties and the amounts of collateral that would have been contractually required at December 31, 2018 if the long-term senior debt ratings for the Corporation or certain subsidiaries had been lower by one incremental notch and by an additional second incremental notch.

Derivative Liabilities Subject to Unilateral Termination Upon Downgrade at December 31, 2018

(Dollars in millions)	**One incremental notch**	**Second incremental notch**
Derivative liabilities	$ 13	$ 581
Collateral posted	1	305

Valuation Adjustments on Derivatives

The Corporation records credit risk valuation adjustments on derivatives in order to properly reflect the credit quality of the counterparties and its own credit quality. The Corporation calculates valuation adjustments on derivatives based on a modeled expected exposure that incorporates current market risk factors. The exposure also takes into consideration credit mitigants such as enforceable master netting agreements and collateral. CDS spread data is used to estimate the default probabilities and severities that are applied to the exposures. Where no observable credit default data is available for counterparties, the Corporation uses proxies and other market data to estimate default probabilities and severity.

Valuation adjustments on derivatives are affected by changes in market spreads, non-credit related market factors such as interest rate and currency changes that affect the expected exposure, and other factors like changes in collateral arrangements and partial payments. Credit spreads and non-credit factors can move independently. For example, for an interest rate swap, changes in interest rates may increase the expected exposure, which would increase the counterparty credit valuation adjustment (CVA). Independently, counterparty credit spreads may tighten, which would result in an offsetting decrease to CVA.

The Corporation enters into risk management activities to offset market driven exposures. The Corporation often hedges the counterparty spread risk in CVA with CDS. The Corporation hedges other market risks in both CVA and DVA primarily with currency and interest rate swaps. In certain instances, the net-of-hedge amounts in the table below move in the same direction as the gross amount or may move in the opposite direction. This movement is a consequence of the complex interaction of the risks being hedged, resulting in limitations in the ability to perfectly hedge all of the market exposures at all times.

The table below presents CVA, DVA and FVA gains (losses) on derivatives, which are recorded in trading account profits, on a gross and net of hedge basis for 2018, 2017 and 2016. CVA gains reduce the cumulative CVA thereby increasing the derivative assets balance. DVA gains increase the cumulative DVA thereby decreasing the derivative liabilities balance. CVA and DVA losses have the opposite impact. FVA gains related to derivative assets reduce the cumulative FVA thereby increasing the derivative assets balance. FVA gains related to derivative liabilities increase the cumulative FVA thereby decreasing the derivative liabilities balance. FVA losses have the opposite impact.

Valuation Adjustments on Derivatives *(1)*

Gains (Losses)	**Gross**	**Net**	Gross	Net	Gross	Net
(Dollars in millions)	**2018**		2017		2016	
Derivative assets (CVA)	**$77**	**$187**	$330	$98	$374	$214
Derivative assets/liabilities (FVA)	**(15)**	**14**	160	178	186	102
Derivative liabilities (DVA)	**(19)**	**(55)**	(324)	(281)	24	(141)

(1) At December 31, 2018, 2017 and 2016, cumulative CVA reduced the derivative assets balance by $600 million, $677 million and $1.0 billion, cumulative FVA reduced the net derivatives balance by $151 million, $136 million and $296 million, and cumulative DVA reduced the derivative liabilities balance by $432 million, $450 million and $774 million, respectively.

NOTE 4 Securities

The table below presents the amortized cost, gross unrealized gains and losses, and fair value of AFS debt securities, other debt securities carried at fair value and HTM debt securities at December 31, 2018 and 2017.

Debt Securities

(Dollars in millions)	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
	December 31, 2018			
Available-for-sale debt securities				
Mortgage-backed securities:				
Agency	**$ 125,116**	**$ 138**	**$ (3,428)**	**$ 121,826**
Agency-collateralized mortgage obligations	**5,621**	**19**	**(110)**	**5,530**
Commercial	**14,469**	**11**	**(402)**	**14,078**
Non-agency residential [1]	**1,792**	**136**	**(11)**	**1,917**
Total mortgage-backed securities	**146,998**	**304**	**(3,951)**	**143,351**
U.S. Treasury and agency securities	**56,239**	**62**	**(1,378)**	**54,923**
Non-U.S. securities	**9,307**	**5**	**(6)**	**9,306**
Other taxable securities, substantially all asset-backed securities	**4,387**	**29**	**(6)**	**4,410**
Total taxable securities	**216,931**	**400**	**(5,341)**	**211,990**
Tax-exempt securities	**17,349**	**99**	**(72)**	**17,376**
Total available-for-sale debt securities	**234,280**	**499**	**(5,413)**	**229,366**
Other debt securities carried at fair value	**8,595**	**172**	**(32)**	**8,735**
Total debt securities carried at fair value	**242,875**	**671**	**(5,445)**	**238,101**
Held-to-maturity debt securities, substantially all U.S. agency mortgage-backed securities [2]	**203,652**	**747**	**(3,964)**	**200,435**
Total debt securities [3, 4]	**$ 446,527**	**$ 1,418**	**$ (9,409)**	**$ 438,536**
	December 31, 2017			
Available-for-sale debt securities				
Mortgage-backed securities:				
Agency	$ 194,119	$ 506	$ (1,696)	$ 192,929
Agency-collateralized mortgage obligations	6,846	39	(81)	6,804
Commercial	13,864	28	(208)	13,684
Non-agency residential [1]	2,410	267	(8)	2,669
Total mortgage-backed securities	217,239	840	(1,993)	216,086
U.S. Treasury and agency securities	54,523	18	(1,018)	53,523
Non-U.S. securities	6,669	9	(1)	6,677
Other taxable securities, substantially all asset-backed securities	5,699	73	(2)	5,770
Total taxable securities	284,130	940	(3,014)	282,056
Tax-exempt securities	20,541	138	(104)	20,575
Total available-for-sale debt securities	304,671	1,078	(3,118)	302,631
Other debt securities carried at fair value	12,273	252	(39)	12,486
Total debt securities carried at fair value	316,944	1,330	(3,157)	315,117
Held-to-maturity debt securities, substantially all U.S. agency mortgage-backed securities	125,013	111	(1,825)	123,299
Total debt securities [3, 4]	$ 441,957	$ 1,441	$ (4,982)	$ 438,416
Available-for-sale marketable equity securities [5]	$ 27	$ —	$ (2)	$ 25

(1) At December 31, 2018 and 2017, the underlying collateral type included approximately 68 percent and 62 percent prime, 4 percent and 13 percent Alt-A, and 28 percent and 25 percent subprime.

(2) During 2018, the Corporation transferred AFS debt securities with an amortized cost of $64.5 billion to held to maturity.

(3) Includes securities pledged as collateral of $40.6 billion and $35.8 billion at December 31, 2018 and 2017.

(4) The Corporation had debt securities from FNMA and FHLMC that each exceeded 10 percent of shareholders' equity, with an amortized cost of $161.2 billion and $52.2 billion, and a fair value of $158.5 billion and $51.4 billion at December 31, 2018, and an amortized cost of $163.6 billion and $50.3 billion, and a fair value of $162.1 billion and $50.0 billion at December 31, 2017.

(5) Classified in other assets on the Consolidated Balance Sheet.

At December 31, 2018, the accumulated net unrealized loss on AFS debt securities included in accumulated OCI was $3.7 billion, net of the related income tax benefit of $1.2 billion. The Corporation had nonperforming AFS debt securities of $11 million and $99 million at December 31, 2018 and 2017.

Effective January 1, 2018, the Corporation adopted an accounting standard applicable to equity securities. For additional information, see *Note 1 – Summary of Significant Accounting Principles*. At December 31, 2018, the Corporation held equity securities at an aggregate fair value of $893 million and other equity securities, as valued under the measurement alternative,

at cost of $219 million, both of which are included in other assets. At December 31, 2018, the Corporation also held equity securities at fair value of $1.2 billion included in time deposits placed and other short-term investments.

The following table presents the components of other debt securities carried at fair value where the changes in fair value are reported in other income. In 2018, the Corporation recorded unrealized mark-to-market net losses of $73 million and realized net gains of $140 million, and unrealized mark-to-market net gains of $243 million and realized net losses of $49 million in 2017. These amounts exclude hedge results.

Other Debt Securities Carried at Fair Value

(Dollars in millions)	December 31 2018	2017
Mortgage-backed securities	**$1,606**	$2,769
U.S. Treasury and agency securities	**1,282**	—
Non-U.S. securities [1]	**5,844**	9,488
Other taxable securities, substantially all asset-backed securities	**3**	229
Total	**$8,735**	$12,486

(1) These securities are primarily used to satisfy certain international regulatory liquidity requirements.

The gross realized gains and losses on sales of AFS debt securities for 2018, 2017 and 2016 are presented in the table below.

Gains and Losses on Sales of AFS Debt Securities

(Dollars in millions)	2018	2017	2016
Gross gains	**$169**	$352	$520
Gross losses	**(15)**	(97)	(30)
Net gains on sales of AFS debt securities	**$154**	$255	$490
Income tax expense attributable to realized net gains on sales of AFS debt securities	**$37**	$97	$186

The table below presents the fair value and the associated gross unrealized losses on AFS debt securities and whether these securities have had gross unrealized losses for less than 12 months or for 12 months or longer at December 31, 2018 and 2017.

Temporarily Impaired and Other-than-temporarily Impaired AFS Debt Securities

	Less than Twelve Months		Twelve Months or Longer		Total	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
(Dollars in millions)	December 31, 2018					
Temporarily impaired AFS debt securities						
Mortgage-backed securities:						
Agency	**$14,771**	**$ (49)**	**$99,211**	**$ (3,379)**	**$113,982**	**$ (3,428)**
Agency-collateralized mortgage obligations	**3**	**—**	**4,452**	**(110)**	**4,455**	**(110)**
Commercial	**1,344**	**(8)**	**11,991**	**(394)**	**13,335**	**(402)**
Non-agency residential	**106**	**(8)**	**49**	**(3)**	**155**	**(11)**
Total mortgage-backed securities	**16,224**	**(65)**	**115,703**	**(3,886)**	**131,927**	**(3,951)**
U.S. Treasury and agency securities	**288**	**(1)**	**51,374**	**(1,377)**	**51,662**	**(1,378)**
Non-U.S. securities	**773**	**(5)**	**21**	**(1)**	**794**	**(6)**
Other taxable securities, substantially all asset-backed securities	**183**	**(1)**	**185**	**(5)**	**368**	**(6)**
Total taxable securities	**17,468**	**(72)**	**167,283**	**(5,269)**	**184,751**	**(5,341)**
Tax-exempt securities	**232**	**(2)**	**2,148**	**(70)**	**2,380**	**(72)**
Total temporarily impaired AFS debt securities	**17,700**	**(74)**	**169,431**	**(5,339)**	**187,131**	**(5,413)**
Other-than-temporarily impaired AFS debt securities [1]						
Non-agency residential mortgage-backed securities	**131**	**—**	**3**	**—**	**134**	**—**
	$17,831	**$ (74)**	**$169,434**	**$ (5,339)**	**$187,265**	**$ (5,413)**

Total temporarily impaired and other-than-temporarily impaired AFS debt securities

	December 31, 2017					
Temporarily impaired AFS debt securities						
Mortgage-backed securities:						
Agency	$ 73,535	$ (352)	$ 72,612	$ (1,344)	$ 146,147	$ (1,696)
Agency-collateralized mortgage obligations	2,743	(29)	1,684	(52)	4,427	(81)
Commercial	5,575	(50)	4,586	(158)	10,161	(208)
Non-agency residential	335	(7)	—	—	335	(7)
Total mortgage-backed securities	82,188	(438)	78,882	(1,554)	161,070	(1,992)
U.S. Treasury and agency securities	27,537	(251)	24,035	(767)	51,572	(1,018)
Non-U.S. securities	772	(1)	—	—	772	(1)
Other taxable securities, substantially all asset-backed securities	—	—	92	(2)	92	(2)
Total taxable securities	110,497	(690)	103,009	(2,323)	213,506	(3,013)
Tax-exempt securities	1,090	(2)	7,100	(102)	8,190	(104)
Total temporarily impaired AFS debt securities	111,587	(692)	110,109	(2,425)	221,696	(3,117)
Other-than-temporarily impaired AFS debt securities [(1)]						