

STATE STREET CORP
Form 10-K
February 21, 2019
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549
Form 10-K

x 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 No. 001-07511

STATE STREET CORPORATION
(Exact name of registrant as specified in its charter)
Massachusetts

(State or other jurisdiction of incorporation)

One Lincoln Street
Boston, Massachusetts
(Address of principal executive office)
617-786-3000

(Registrant's telephone number, including area code)

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

(Title of Each Class)

Common Stock, \$1 par value per share

Depository Shares, each representing a 1/4,000th ownership interest in a share of
Non-Cumulative Perpetual Preferred Stock, Series C, without par value per share

Depository Shares, each representing a 1/4,000th ownership interest in a share of
Fixed-to-Floating Rate Non-Cumulative Perpetual Preferred Stock, Series D, without par
value per share

Depository Shares, each representing a 1/4,000th ownership interest in a share of
Non-Cumulative Perpetual Preferred Stock, Series E, without par value per share

Depository Shares, each representing a 1/4,000th ownership interest in a share of
Non-Cumulative Perpetual Preferred Stock, Series G, without par value per share

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

None

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

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

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

04-2456637
(I.R.S. Employer
Identification No.)

02111
(Zip Code)

(Name of each exchange on
which registered)

New York Stock Exchange

New York Stock Exchange

New York Stock Exchange

New York Stock Exchange

New York Stock Exchange

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) 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.

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

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

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act).

The aggregate market value of the voting and non-voting common equity held by non-affiliates computed by reference to the per share price (\$93.09) at which the common equity was last sold as of the last business day of the registrant's most recently completed second fiscal quarter (June 30, 2018) was approximately \$33.94 billion.

The number of shares of the registrant's common stock outstanding as of January 31, 2019 was 378,659,763.

Portions of the following documents are incorporated by reference into Parts of this Report on Form 10-K, to the extent noted in such Parts, as indicated below:

(1) The registrant's definitive Proxy Statement for the 2019 Annual Meeting of Shareholders to be filed pursuant to Regulation 14A on or before April 30, 2019 (Part III).

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 ANNUAL REPORT ON FORM 10-K FOR THE YEAR ENDED
 December 31, 2018

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PART I

ITEM 1. BUSINESS

GENERAL

State Street Corporation, referred to as the Parent Company, is a financial holding company organized in 1969 under the laws of the Commonwealth of Massachusetts. Our executive offices are located at One Lincoln Street, Boston, Massachusetts 02111 (telephone (617) 786-3000). For purposes of this Form 10-K, unless the context requires otherwise, references to "State Street," "we," "us," "our" or similar terms mean State Street Corporation and its subsidiaries on a consolidated basis. The Parent Company is a source of financial and managerial strength to our subsidiaries.

Through our subsidiaries, including our principal banking subsidiary, State Street Bank and Trust Company, referred to as State Street Bank, we provide a broad range of financial products and services to institutional investors worldwide, with \$31.62 trillion of AUC/A and \$2.51 trillion of AUM as of December 31, 2018.

As of December 31, 2018, we had consolidated total assets of \$244.63 billion, consolidated total deposits of \$180.36 billion, consolidated total shareholders' equity of \$24.79 billion and over 40,000 employees. We operate in more than 100 geographic markets worldwide, including the U.S., Canada, Europe, the Middle East and Asia.

On the "Investor Relations" section of our corporate website at www.statestreet.com, we make available, free of charge, all reports we electronically file with, or furnish to, the SEC including our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, as well as any amendments to those reports, as soon as reasonably practicable after those documents have been filed with, or furnished to, the SEC. These documents are also accessible on the SEC's website at www.sec.gov. We have included the website addresses of State Street and the SEC in this report as inactive textual references only. Information on those websites is not incorporated by reference in this Form 10-K.

We have Corporate Governance Guidelines, as well as written charters for the Examining and Audit Committee, the Executive Committee, the Executive Compensation Committee, the Nominating and Corporate Governance Committee, the Risk Committee and the Technology and Operations Committee of our Board of Directors, or Board, and a Code of Ethics for senior financial officers, a Standard of Conduct for Directors and a Standard of Conduct for our employees. Each of these documents is posted on the "Investor Relations" section of our website under "Corporate Governance."

We provide additional disclosures required by applicable bank regulatory standards, including

supplemental qualitative and quantitative information with respect to regulatory capital (including market risk associated with our trading activities) and the liquidity coverage ratio, summary results of semi-annual State Street-run stress tests which we conduct under the Dodd-Frank Act and resolution plan disclosures required under the Dodd-Frank Act. These additional disclosures are available on the "Investor Relations" section of our website under "Filings and Reports."

We use acronyms and other defined terms for certain business terms and abbreviations, as defined on the acronyms list and glossary under Item 8 in this Form 10-K.

BUSINESS DESCRIPTION

Overview

We conduct our business primarily through State Street Bank, which traces its beginnings to the founding of the Union Bank in 1792. State Street Bank's current charter was authorized by a special Act of the Massachusetts Legislature in 1891, and its present name was adopted in 1960. State Street Bank operates as a specialized bank, referred to as a trust or custody bank, that services and manages assets on behalf of its institutional clients.

Our clients include mutual funds, collective investment funds and other investment pools, corporate and public retirement plans, insurance companies, foundations, endowments and investment managers.

LINES OF BUSINESS

We have two lines of business: Investment Servicing and Investment Management.

Investment Servicing

Our Investment Servicing line of business performs core custody and related value-added functions, such as providing institutional investors with clearing, settlement and payment services. Our financial services and products allow our

large institutional investor clients to execute financial transactions on a daily basis in markets across the globe. As most institutional investors cannot economically or efficiently build their own technology and operational processes necessary to facilitate their global securities settlement needs, our role as a global trust and custody bank is generally to aid our clients to efficiently perform services associated with the clearing, settlement and execution of securities transactions and related payments.

Our Investment Servicing products and services include: custody; product and participant level accounting; daily pricing and administration; master trust and master custody; depotbank services (a fund oversight role created by regulation); record-keeping; cash management; foreign exchange, brokerage and other trading services; securities finance; our enhanced custody product, which integrates principal securities lending and custody; deposit and short-term investment

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facilities; loans and lease financing; investment manager and alternative investment manager operations outsourcing; performance, risk and compliance analytics; and financial data management to support institutional investors. Included within our Investment Servicing line of business is Charles River Systems, Inc. (Charles River Development), which we acquired on October 1, 2018. As a result of our acquisition of Charles River Development, we are extending our core capabilities by creating a front-to-back office platform that combines our core back and middle office services with front office solutions across all asset classes for portfolio management, trading and compliance. New products and services resulting from our acquisition of Charles River Development include: portfolio modeling and construction, trade order management, investment risk and compliance and wealth management solutions.

We provide some or all of the Investment Servicing integrated products and services to clients in the U.S. and in many other markets, including, among others, Australia, Cayman Islands, France, Germany, Ireland, Italy, Japan, Luxembourg and the U.K. As of December 31, 2018, we serviced AUC/A of approximately \$23.20 trillion in the Americas, approximately \$6.70 trillion in Europe and the Middle East and approximately \$1.72 trillion in the Asia-Pacific region.

Investment Management

Our Investment Management line of business, through State Street Global Advisors, provides a broad range of investment management strategies and products for our clients. Our investment management strategies and products span the risk/reward spectrum, including core and enhanced indexing, multi-asset strategies, active quantitative and fundamental active capabilities and alternative investment strategies. Our AUM is currently primarily weighted to indexed strategies. In addition, we provide a breadth of services and solutions, including environmental, social and governance investing, defined benefit and defined contribution and Outsourced Chief Investment Officer (OCIO). State Street Global Advisors is also a provider of ETFs, including the SPDR® ETF brand. While management fees are primarily determined by the values of AUM and the investment strategies employed, management fees reflect other factors as well, including the benchmarks specified in the respective management agreements related to performance fees. As of December 31, 2018, State Street Global Advisors had AUM of approximately \$2.51 trillion. Additional information about our lines of business is provided under “Line of Business Information” included in our Management's Discussion and Analysis, and in Note 24 to the consolidated financial statements in this Form 10-K. Additional information about our non-U.S. activities is included in Note 26 to the consolidated financial statements in this Form 10-K.

COMPETITION

We operate in a highly competitive environment in all areas of our business globally. Our competitors include a broad range of financial institutions and servicing companies, including other custodial banks, deposit-taking institutions, investment management firms, insurance companies, mutual funds, broker/dealers, investment banks, benefits consultants, investment analytic businesses, business service and software companies and information services firms. As our businesses grow and markets evolve, we may encounter increasing and new forms of competition around the world.

We believe that many key factors drive competition in the markets for our business. Technological expertise, economies of scale, required levels of capital, pricing, quality and scope of services and sales and marketing are critical to our Investment Servicing line of business. For our Investment Management line of business, key competitive factors include expertise, experience, availability of related service offerings, quality of service, price, efficiency of our products and services and performance.

Our competitive success may depend on our ability to develop and market new and innovative services, to adopt or develop new technologies, to bring new services to market in a timely fashion at competitive prices, to integrate existing and future products and services effectively into an interoperable platform, to continue to expand our relationships with existing clients, and to attract new clients.

We are a systemically important financial institution (SIFI) and are subject to extensive regulation and supervision with respect to our operations and activities. Not all of our competitors have similarly been designated as systemically important nor are all of them subject to the same degree of regulation as a bank or financial holding company, and

therefore some of our competitors may not be subject to the same limitations, requirements and standards with respect to their operations and activities. Most other financial institutions designated as systemically important have substantially greater financial resources and a broader base of operations than us and are, consequently, in a better competitive position to manage and bear the costs of this enhanced regulatory requirement. See "Supervision and Regulation" in this Item for more information.

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SUPERVISION AND REGULATION

We are registered with the Federal Reserve as a bank holding company pursuant to the Bank Holding Company Act of 1956. The Bank Holding Company Act generally limits the activities in which bank holding companies and their non-banking subsidiaries may engage to managing or controlling banks and to a range of activities that are considered to be closely related to banking. Bank holding companies that have elected to be treated as financial holding companies, such as the Parent Company, may engage in a broader range of activities considered to be "financial in nature." The regulatory limits on our activities also apply to non-banking entities that we are deemed to "control" for purposes of the Bank Holding Company Act, which may include companies of which we own or control more than 5% of a class of voting shares. The Federal Reserve may order a bank holding company to terminate any activity, or its ownership or control of a non-banking subsidiary, if the Federal Reserve finds that the activity, ownership or control constitutes a serious risk to the financial safety, soundness or stability of a banking subsidiary or is inconsistent with sound banking principles or statutory purposes. The Bank Holding Company Act also requires a bank holding company to obtain prior approval of the Federal Reserve before it acquires substantially all the assets of any bank, or ownership or control of more than 5% of the voting shares of any bank.

The Parent Company has elected to be treated as a financial holding company and, as such, may engage in a broader range of non-banking activities than permitted for bank holding companies and their subsidiaries that have not elected to become financial holding companies. Financial holding companies may engage directly or indirectly, either de novo or by acquisition, in activities that are defined by the Federal Reserve to be financial in nature, provided that the financial holding company gives the Federal Reserve after-the-fact notice of the new activities. Activities defined to be financial in nature include, but are not limited to, the following: providing financial or investment advice; underwriting; dealing in or making markets in securities; making merchant banking investments, subject to significant limitations; and any activities previously found by the Federal Reserve to be closely related to banking. In order to maintain our status as a financial holding company, we and each of our U.S. depository institution subsidiaries are expected to be well capitalized and well managed, as defined in applicable regulations and determined in part by the results of regulatory examinations, and must comply with Community Reinvestment Act obligations. Failure to maintain these standards may result in restrictions on our activities and may ultimately permit the Federal Reserve to take enforcement actions against us and restrict our ability to engage in activities defined to be financial in nature. Currently, under the

Bank Holding Company Act, we may not be able to engage in new activities or acquire shares or control of other businesses.

In response to the financial crisis, as well as other factors, such as technological and market changes, both the scope of the laws and regulations and the intensity of the supervision to which our business is subject have increased in recent years. Regulatory enforcement and fines have also increased across the banking and financial services sector. Many of these changes have occurred as a result of the Dodd-Frank Act and its implementing regulations, most of which are now in place. The U.S. President issued an executive order that sets forth principles for the reform of the federal financial regulatory framework, and, in May 2018, the Economic Growth, Regulatory Relief and Consumer Protection Act (EGRRCPA) was enacted. The EGRRCPA's revisions to the U.S. financial regulatory framework, some of which remain subject to further rulemaking, have altered certain laws and regulations applicable to us and other major financial services firms. Irrespective of any regulatory change, we expect that our business will remain subject to extensive regulation and supervision.

In addition, increased regulatory requirements have been and are being implemented internationally with respect to financial institutions, including, but not limited to, the implementation of the Basel III final rule (refer to "Regulatory Capital Adequacy and Liquidity Standards" in this "Supervision and Regulation" section and under "Capital" in "Financial Condition" in our Management's Discussion and Analysis in this Form 10-K for a discussion of Basel III), the Alternative Investment Fund Managers Directive (AIFMD), the Bank Recovery and Resolution Directive (BRRD), the European Market Infrastructure Regulation (EMIR), the Undertakings for Collective Investment in Transferable Securities (UCITS) directives, the Markets in Financial Instruments Directive II (MiFID II), the Markets in Financial Instruments Regulation (MiFIR) and the E.U. General Data Protection Regulation (GDPR).

Many aspects of our business are subject to regulation by other U.S. federal and state governmental and regulatory agencies and self-regulatory organizations (including securities exchanges), and by non-U.S. governmental and regulatory agencies and self-regulatory organizations. Some aspects of our public disclosure, corporate governance principles and internal control systems are subject to SOX, the Dodd-Frank Act and regulations and rules of the SEC and the NYSE.

Regulatory Capital Adequacy and Liquidity Standards

Basel III Final Rule

We and State Street Bank, as advanced approaches banking organizations, are subject to the Basel III framework in the U.S. Provisions of the Basel

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III final rule that became effective under a transition timetable which began in January 2014, with full implementation required beginning on January 1, 2019. Since January 2013, we have been subject to the final market risk capital rule jointly issued by U.S. banking regulators to implement the changes to the market risk capital framework in the U.S. The Basel III final rule provides for two frameworks for the calculation of RWA for purposes of bank regulatory compliance: the “standardized” approach and the “advanced” approaches, which are applicable to advanced approaches banking organizations, like us. The standardized approach prescribes standardized risk weights for certain on- and off-balance sheet exposures in the calculation of RWA. The advanced approaches consist of the Advanced Internal Ratings-Based Approach (AIRB) used for the calculation of RWA related to credit risk, and the Advanced Measurement Approach (AMA) used for the calculation of RWA related to operational risk.

Among other things, the Basel III final rule does the following:

- adds requirements for a minimum CET1 risk-based capital ratio of 4.5% and a minimum supplementary leverage ratio of 3% for advanced approaches banking organizations;
- raises the minimum tier 1 risk-based capital ratio from 4% under both Basel I and Basel II to 6%;
- leaves the minimum total capital ratio at 8%;
- implements the capital conservation and countercyclical capital buffers, referenced below, as well as a G-SIB surcharge included under "Capital" in "Financial Condition" in our Management's Discussion and Analysis in this Form 10-K;
- implements the previously described standardized approach to replace the calculation of credit RWA under Basel I; and
- implements the advanced approaches for the calculation of credit RWA.

Beginning January 1, 2018, the U.S. banking regulators required a minimum SLR requirement of 5% for us and the other eight U.S. G-SIBs in order to avoid any limitations on distributions and discretionary bonus payments and a minimum SLR requirement of 6% for the Insured Depository Institutions' subsidiaries (State Street Bank) of such G-SIBs. On April 11, 2018, the Federal Reserve proposed modifications to SLR that would replace the current 2% SLR buffer applicable to us with a leverage buffer equal to 50% of G-SIB capital surcharge, which is currently 1.5%. Under the proposal, our SLR buffer would become 0.75%, for a total enhanced SLR (eSLR) requirement of 3.75%, assuming that our G-SIB capital surcharge remains the same when the proposal becomes effective. As part of

the same proposal, the Federal Reserve also proposed to align the well-capitalized eSLR standard applicable to State Street Bank with the proposed SLR buffer applicable to us. Under the proposal, the well-capitalized eSLR requirement for State Street Bank would change from the current 6% to 3% plus 50% of our current G-SIB capital surcharge, for a total well-capitalized SLR requirement of 3.75%, assuming that our G-SIB capital surcharge remains the same when the proposal becomes effective. Furthermore, EGRRCPA directed the U.S. banking regulators to amend regulation to exclude certain central bank balances from the measure of total leverage exposure, the SLR denominator, for custody banks. Specifically, central bank balances would be excluded to the extent of the value of client deposits at the custody bank that are linked to fiduciary, custody or safekeeping accounts. The U.S. banking agencies have not yet issued a proposed rule implementing this provision of EGRRCPA.

In addition to SLR, we are subject to a minimum tier 1 leverage ratio of 4%, which differs from SLR primarily in that the denominator of the tier 1 leverage ratio is a quarterly average of on-balance sheet assets and does not include any off-balance sheet exposures. We are required to include SLR disclosures with our other Basel disclosures.

Under the Basel III final rule, a banking organization would be able to make capital distributions (subject to other regulatory constraints, such as regulator review of its capital plans) and discretionary bonus payments without specified limitations, as long as it maintains the required capital conservation buffer of 2.5% plus the applicable G-SIB surcharge (plus any potentially applicable countercyclical capital buffer) over the minimum required risk-based capital ratios and well capitalized leverage based requirements. Banking regulators would establish the minimum countercyclical capital buffer, which is initially set by banking regulators at zero, up to a maximum of 2.5% of total RWAs under certain economic conditions. The Federal Reserve has proposed changes to its stress testing and capital planning rules that would replace the capital conservation buffer with a Stress Capital Buffer. For additional information about the proposal, refer to “Capital Planning, Stress Tests and Dividends” in this "Supervision and

Regulation" section.

Under the Basel III final rule, our total regulatory capital is composed of three tiers; CET1 capital, tier 1 capital (which includes CET1 capital), and tier 2 capital. The total of tier 1 and tier 2 capital, adjusted as applicable, is referred to as total regulatory capital.

CET1 capital is composed of core capital elements, such as qualifying common shareholders' equity and related surplus; retained earnings; the cumulative effect of foreign currency translation; and net unrealized gains (losses) on debt and equity securities classified as AFS; reduced by treasury stock.

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Goodwill and other intangible assets, net of related deferred tax liabilities, are deducted from the core CET1 capital elements. Tier 1 capital is composed of CET1 capital plus additional tier 1 capital instruments which, for us, includes six series of preferred equity. Tier 2 capital includes certain eligible subordinated long-term debt instruments. The Basel III phase-in and phase-out schedules for calculating regulatory capital that apply to State Street have concluded and our capital measures are considered fully phased-in. Minimum capital ratio, buffer, and G-SIB surcharge requirements become fully phased-in as of January 1, 2019.

Certain other items, if applicable, must be deducted from tier 1 and tier 2 capital. These items primarily include deductible investments in unconsolidated banking, financial and insurance entities where we hold more than 50% of the entities' capital; and the amount of expected credit losses that exceeds recorded allowances for loan and other credit losses. Expected credit losses are calculated for wholesale credit exposures by formula in conformity with the Basel III final rule.

On October 30, 2018, the U.S. banking regulators issued a proposal that would, among other things, implement the standardized approach for counterparty credit risk (SA-CCR), a new methodology for calculating the exposure amount for derivative contracts under the U.S. regulatory capital rules. Under the proposal, we would have the option to use the SA-CCR or the Internal Model Methodology (IMM) to measure the exposure amount of our cleared and uncleared derivative transactions, as well as the RWA amount of our central counterparty default fund contributions, under our advanced approach capital calculation. We would be required to determine the amount of these exposures using the SA-CCR under our standardized approach capital calculation. The proposal would also incorporate the SA-CCR into the calculation of our total leverage exposure for the purpose of calculating SLR. The proposal requires us to implement SA-CCR by July 1, 2020 but would permit early adoption before that date after a final rule implementing SA-CCR is effective.

As required by the Dodd-Frank Act, we and State Street Bank, as advanced approaches banking organizations, are subject to a permanent "capital floor," also referred to as the Collins Amendment, in the assessment of our regulatory capital adequacy, including the capital conservation buffer and countercyclical capital buffer described above in this "Supervision and Regulation" section. Our risk-based capital ratios for regulatory assessment purposes are the lower of each ratio calculated under the standardized approach and the advanced approaches.

Failure to meet current and future regulatory capital requirements could subject us to a variety of enforcement actions, including the termination of State Street Bank's deposit insurance by the FDIC, and to certain restrictions on our business, including those that

are described above in this "Supervision and Regulation" section.

For additional information about our regulatory capital position and our regulatory capital adequacy, as well as current and future regulatory capital requirements, refer to "Capital" in "Financial Condition" in our Management's Discussion and Analysis, and Note 16 to the consolidated financial statements in this Form 10-K.

Global Systemically Important Bank

In addition to the Basel III final rule, we are subject to the Federal Reserve's final rule imposing a capital surcharge on U.S. G-SIBs. The surcharge requirements within the final rule began to phase-in on January 2016 and became fully effective on January 1, 2019. The eight U.S. banks deemed to be G-SIBs, including us, are required to calculate the G-SIB surcharge annually according to two methods, and be bound by the higher of the two:

• Method 1: Assesses systemic importance based upon five equally-weighted components: size, interconnectedness, complexity, cross-jurisdictional activity and substitutability; or

• Method 2: Alters the calculation from Method 1 by factoring in a wholesale funding score in place of substitutability and applying a 2x multiplier to the sum of the five components.

Method 2 currently is the binding methodology for us and our applicable surcharge for 2019 was calculated to be 1.5%, which is based on a calculation date of December 31, 2017. Assuming a countercyclical buffer of 0%, the minimum capital ratios as of January 1, 2019, including a capital conservation buffer of 2.5% and a G-SIB surcharge of 1.5% in 2019, are 8.5% for CET1 capital, 10.0% for tier 1 risk-based capital and 12.0% for total risk-based capital, in order for us to make capital distributions and discretionary bonus payments without limitation. Further, like all other U.S. G-SIBs, we are also currently subject to a 2% leverage buffer under the Basel III final rule, subject to the

Federal Reserve's proposed changes to the SLR. If we fail to exceed the 2% leverage buffer, we will be subject to increased restrictions (depending upon the extent of the shortfall) regarding capital distributions and discretionary executive bonus payments. Not all of our competitors have similarly been designated as systemically important nor are all of them subject to the same degree of regulation as a bank or financial holding company, and therefore some of our competitors may not be subject to the same additional capital requirements.

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Total Loss-Absorbing Capacity

In 2016, the Federal Reserve released its final rule on TLAC, LTD and clean holding company requirements for U.S. domiciled G-SIBs, such as us, that are intended to improve the resiliency and resolvability of certain U.S. banking organizations through enhanced prudential standards. The TLAC final rule imposes: (1) external TLAC requirements (i.e., combined eligible tier 1 regulatory capital and LTD); (2) separate external LTD requirements; and (3) clean holding company requirements that impose restrictions on certain types of liabilities and limit non-TLAC related third party liabilities to 5% of external TLAC.

Among other things, the TLAC final rule requires us to comply with minimum requirements for external TLAC and external LTD effective January 1, 2019. Specifically, we must hold (1) combined eligible tier 1 regulatory capital and LTD in the amount equal to the greater of 21.5% of total RWA (18.0% minimum plus a 2.5% capital conservation buffer plus a G-SIB surcharge calculated for these purposes under Method 1 of 1.0%) and 9.5% of total leverage exposure (7.5% minimum plus the eSLR buffer of 2.0%), as defined by the SLR final rule; and (2) qualifying external LTD equal to the greater of 7.5% of RWA (6.0% minimum plus a G-SIB surcharge calculated for these purposes under method 2 of 1.5%) and 4.5% of total leverage exposure, as defined by the SLR final rule.

We requested and received from the Federal Reserve, a one year extension from January 1, 2019 to January 1, 2020, for compliance with the LTD SLR requirements of the rule. In granting the extension request, the Federal Reserve noted the EGRRCPA that was signed into law in May 2018, under which the Federal Reserve and the other U.S. federal banking agencies must promulgate rules to exclude certain central bank placements from the calculation of SLR for custodial banks, such as us. This regulatory change is expected to reduce the LTD we are required to hold as calculated under the current requirements.

The extension will allow us to determine the appropriate amount of LTD needed to comply with the LTD SLR requirements of the TLAC rule after the Federal Reserve and the other U.S. federal banking agencies have adopted this regulatory change. For additional information about TLAC and SLR, refer to "Basel III Final Rule" in this "Supervision and Regulation" section.

Liquidity Coverage Ratio and Net Stable Funding Ratio

In addition to capital standards, the Basel III final rule introduced two quantitative liquidity standards: the LCR and the NSFR.

We are subject to the final rule issued by the U.S. banking regulators implementing the BCBS' LCR in the U.S. The LCR is intended to promote the short-term resilience of internationally active banking

organizations, like us, to improve the banking industry's ability to absorb shocks arising from market stress over a 30 calendar day period and improve the measurement and management of liquidity risk.

The LCR measures an institution's HQLA against its net cash outflows. We report LCR to the Federal Reserve daily. For the quarters ended December 31, 2018 and December 31, 2017, daily average LCR for the Parent Company was 108% and 112%, respectively. In addition, we publicly disclose certain qualitative and quantitative information about our LCR consistent with the requirements of the Federal Reserve's December 2016 final rule.

Compliance with the LCR has required that we maintain an investment portfolio that contains an adequate amount of HQLA. In general, HQLA investments generate a lower investment return than other types of investments, resulting in a negative impact on our NII and our NIM. In addition, the level of HQLA we are required to maintain under the LCR is dependent upon our client relationships and the nature of services we provide, which may change over time.

Deposits resulting from certain services provided ("operational deposits") are treated as more resilient during periods of stress than other deposits. As a result, if balances of operational deposits increased relative to our total client deposit base, we would expect to require less HQLA in order to maintain our LCR. Conversely, if balances of operational deposits decreased relative to our total client deposit base, we would expect to require more HQLA.

The BCBS has also issued final guidance with respect to the NSFR. In 2016, the OCC, Federal Reserve and FDIC issued a proposal to implement the NSFR in the U.S. that is largely consistent with the BCBS guidance. The proposal would require banking organizations to maintain an amount of available stable funding, which is calculated by applying standardized weightings to its equity and liabilities based on their expected stability, that is no less than the amount of its required stable funding, which is calculated by applying standardized weightings to its assets,

derivatives exposures, and certain other off-balance sheet exposures based on their liquidity characteristics.

Capital Planning, Stress Tests and Dividends

Pursuant to the Dodd-Frank Act, the Federal Reserve has adopted capital planning and stress test requirements for large bank holding companies, including us, which form part of the Federal Reserve's annual CCAR framework. CCAR is used by the Federal Reserve to evaluate our management of capital, the adequacy of our regulatory capital and the potential requirement for us to maintain capital levels above regulatory minimums. Under the Federal Reserve's capital plan final rule, we must conduct periodic stress testing of our business operations and submit an annual capital plan to the Federal Reserve, taking into account

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the results of separate stress tests designed by us and by the Federal Reserve.

The capital plan must include a description of all of our planned capital actions over a nine-quarter planning horizon, including any capital qualifying instruments, any capital distributions, such as payments of dividends on, or repurchases of, our stock, and any similar action that the Federal Reserve determines could affect our consolidated capital. The capital plan must include a discussion of how we will maintain capital above the minimum regulatory capital ratios, including the minimum ratios under the Basel III final rule, and serve as a source of strength to our U.S. depository institution subsidiaries under supervisory stress scenarios. The capital plan requirements mandate that we receive no objection to our plan from the Federal Reserve before making a capital distribution. These requirements could require us to revise our stress-testing or capital management approaches, resubmit our capital plan or postpone, cancel or alter our planned capital actions. In addition, changes in our strategy, merger or acquisition activity or unanticipated uses of capital could result in a change in our capital plan and its associated capital actions, including capital raises or modifications to planned capital actions, such as repurchases of our stock, and may require resubmission of the capital plan to the Federal Reserve for its non-objection if, among other reasons, we would not meet our regulatory capital requirements after making the proposed capital distribution.

In addition to its capital planning requirements, the Federal Reserve has the authority to prohibit or to limit the payment of dividends by the banking organizations it supervises, including the Parent Company and State Street Bank, if, in the Federal Reserve's opinion, the payment of a dividend would constitute an unsafe or unsound practice in light of the financial condition of the banking organization. All of these policies and other requirements could affect our ability to pay dividends and repurchase our stock, or require us to provide capital assistance to State Street Bank and any other banking subsidiary.

In June 2018, we received the results of the Federal Reserve's review of our 2018 capital plan in connection with its 2018 annual CCAR process. The Federal Reserve did not object to our capital plan as part of the 2018 CCAR process, conditioned on our making enhancements to the management and analysis of counterparty exposures under stress. In connection with the capital plan, our Board approved a common stock repurchase program authorizing the repurchase of up to \$1.2 billion of our common stock from July 1, 2018 through June 30, 2019 (the 2018 Program). In connection with our acquisition of Charles River Development, we did not repurchase any common stock during 2018 under the 2018 Program. We have resumed our common stock purchase

program in the first quarter of 2019 and may repurchase up to \$600 million through June 30, 2019 under the 2018 Program.

Our common stock and other stock dividends, including the declaration, timing and amount thereof, remain subject to consideration and approval by our Board of Directors at the relevant times.

The Federal Reserve, under the Dodd-Frank Act, requires us to conduct semi-annual State Street-run stress tests and to publicly disclose the summary results of our State Street-run stress tests under the severely adverse economic scenario. In November 2018, we provided summary results of our 2018 mid-cycle State Street-run stress tests on the "Investor Relations" section of our corporate website. We are also required to undergo an annual supervisory stress test conducted by the Federal Reserve. The EGRRCPA modifies certain aspects of these stress-testing requirements, reducing the number of scenarios in the Federal Reserve's supervisory stress test from three to two and modifying our obligation to perform company-run stress-tests from semi-annually to annually. The Federal Reserve issued a proposal in October 2018 that would, among other things, implement this modification.

The Dodd-Frank Act also requires State Street Bank to conduct an annual stress test. State Street Bank published a summary of its stress test results on June 21, 2018.

The Federal Reserve is currently considering making further changes to its capital planning and stress testing requirements.

On April 10, 2018, the Federal Reserve issued a proposal to integrate its annual capital planning and stress testing requirements with certain ongoing regulatory capital requirements. The proposal, which would apply to certain bank holding companies, including us, would introduce a Stress Capital Buffer (SCB) and a Stress Leverage Buffer (SLB) and related changes to the capital planning and stress testing processes. Under the proposal, the requirements would apply only with respect to the standardized approach and tier 1 leverage regulatory capital requirements.

In the standardized approach, the SCB would replace the existing capital conservation buffer. The standardized approach SCB would equal the greater of (i) the maximum decline in our CET1 capital ratio under the severely adverse scenario over the supervisory stress test measurement period, plus the sum of the ratios of the dollar amount of our planned common stock dividends to our projected RWA for each of the fourth through seventh quarters of the supervisory stress test projection period; and (ii) 2.5%. Regulatory capital requirements under the standardized approach would include the SCB, as summarized above, as well as our G-SIB capital surcharge and any applicable countercyclical capital buffer.

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Like the SCB, the SLB would be calculated based on the results of our annual supervisory stress tests. The SLB would equal the maximum decline in our tier 1 leverage ratio under the severely adverse scenario, plus the sum of the ratios of the dollar amount of our planned common stock dividends to our projected leverage ratio denominator for each of the fourth through seventh quarters of the supervisory stress test projection period. No floor would be established for the SLB, which would apply in addition to the current minimum tier 1 leverage ratio of 4%.

The proposal would make related changes to capital planning and stress testing processes for bank holding companies subject to these requirements. In particular, the proposal would limit projected capital actions to planned common stock dividends in the fourth through seventh quarters of the supervisory stress test projection period and would assume that bank holding companies maintain a constant level of assets and RWA throughout the supervisory stress test projection period.

If the proposal is adopted, limitations on capital distributions and discretionary bonus payments to executive officers would be determined by the most stringent limitation, if any, as determined under the standardized approach or the tier 1 leverage ratio, inclusive of the proposed stress buffer requirements, or the advanced approach or SLR or TLAC requirements, inclusive of applicable buffers.

In November 2018, the Federal Reserve's Vice Chairman for Supervision stated that the Federal Reserve does not expect the proposed stress buffer requirements will go into effect before 2020. However, the Federal Reserve does expect to finalize certain elements of the proposed requirements and expects that other elements will be re-proposed and again subject to public comment.

The Volcker Rule

We are subject to the Volcker Rule and implementing regulations. The Volcker Rule prohibits banking entities, including us and our affiliates, from engaging in certain prohibited proprietary trading activities, as defined in the final Volcker Rule regulations, subject to exemptions for market-making related activities, risk-mitigating hedging, underwriting and certain other activities. The Volcker Rule also requires banking entities to either restructure or divest certain ownership interests in, and relationships with, covered funds (as such terms are defined in the final Volcker Rule regulations).

The final Volcker Rule regulations require banking entities to establish extensive programs designed to promote compliance with the restrictions of the Volcker Rule. We have established a compliance program which we believe complies with the final Volcker Rule regulations as currently in effect. Such compliance program restricts our ability in the future to service certain types of funds, in particular covered funds for

which State Street Global Advisors acts as an advisor and certain types of trustee relationships. Consequently, Volcker Rule compliance entails both the cost of a compliance program and loss of certain revenue and future opportunities. On May 30, 2018, the Federal Reserve and the other federal financial regulatory agencies responsible for the Volcker Rule regulations released an interagency proposal that would revise certain elements of those regulations. The proposed changes focus on proprietary trading, including the metrics reporting requirements and certain requirements imposed in connection with permitted market making, underwriting and risk-mitigating hedging activities, including market-making in and underwriting of covered funds. The impact of this proposal on us will not be known with certainty until final rules are issued.

Enhanced Prudential Standards

The Dodd-Frank Act, as amended by the EGRRCPA, establishes a systemic risk regime to which large bank holding companies with \$100 billion or more in consolidated assets, such as us, are subject. The Federal Reserve is required to tailor the application of the enhanced prudential standards to bank holding companies based on their size, complexity, risk profile and other factors. U.S. G-SIBs, such as us, are expected to remain subject to the most stringent requirements, including heightened capital, leverage, liquidity and risk management requirements and single-counterparty credit limits (SCCL).

The FSOC can recommend prudential standards, reporting and disclosure requirements to the Federal Reserve for SIFIs, and must approve any finding by the Federal Reserve that a financial institution poses a grave threat to financial stability and must undertake mitigating actions. The FSOC is also empowered to designate systemically important payment, clearing and settlement activities of financial institutions, subjecting them to prudential supervision and

regulation, and, assisted by the Office of Financial Research within the U.S. Department of the Treasury can gather data and reports from financial institutions, including us.

Under the Federal Reserve's final rule implementing certain of the Dodd-Frank Act's enhanced prudential standards, we are required to comply with various liquidity-related risk management standards and maintain a liquidity buffer of unencumbered highly liquid assets based on the results of internal liquidity stress testing. This liquidity buffer is in addition to other liquidity requirements, such as the LCR and, when implemented, the NSFR. The final rule also establishes requirements and responsibilities for our risk committee and mandates risk management standards.

On June 14, 2018, the Federal Reserve finalized rules that would establish SCCL for large banking organizations. U.S. G-SIBs, including us, are subject to

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a limit of 15% of tier 1 capital for aggregate net credit exposures to any “major counterparty” (defined to include other U.S. G-SIBs, foreign G-SIBs and non-bank systemically important financial institutions supervised by the Federal Reserve). In addition we are subject to a limit of 25% of tier 1 capital for aggregate net credit exposures to any other unaffiliated counterparty. We must comply with the final SCCL rules beginning on January 1, 2020.

The Federal Reserve has established a final rule that imposes contractual requirements on certain “qualified financial contracts” to which U.S. G-SIBs, including us, and their subsidiaries are parties. Under the final rule, certain qualified financial contracts generally must expressly provide that transfer restrictions and default rights against a U.S. G-SIB, or subsidiary of a U.S. G-SIB, are limited to the same extent as they would be under the Federal Deposit Insurance Act and Title II of the Dodd-Frank Act and their implementing regulations. In addition, certain qualified financial contracts may not, among other things, permit the exercise of any cross-default right against a U.S. G-SIB or subsidiary of a U.S. G-SIB based on an affiliate’s entry into insolvency, resolution or similar proceedings, subject to certain creditor protections. There is a phased-in compliance schedule based on counterparty type, and the first compliance date was January 1, 2019.

In addition, the Federal Reserve has proposed rules that would create an early-remediation regime to address financial distress or material management weaknesses determined with reference to four levels of early remediation, including heightened supervisory review, initial remediation, recovery, and resolution assessment, with specific limitations and requirements tied to each level.

The systemic-risk regime also provides that for U.S. G-SIBs deemed to pose a grave threat to U.S. financial stability, the Federal Reserve, upon an FSOC vote, must limit that institution’s ability to merge, restrict its ability to offer financial products, require it to terminate activities, impose conditions on activities or, as a last resort, require it to dispose of assets. Upon a grave threat determination by the FSOC, the Federal Reserve must issue rules that require financial institutions subject to the systemic-risk regime to maintain a debt-to-equity ratio of no more than 15 to 1 if the FSOC considers it necessary to mitigate the risk of the grave threat. The Federal Reserve also has the ability to establish further standards, including those regarding contingent capital, enhanced public disclosures and limits on short-term debt, including off-balance sheet exposures.

Resolution Planning

We are required to periodically submit a plan for rapid and orderly resolution in the event of material financial distress or failure, commonly referred to as a

resolution plan or a living will, to the Federal Reserve and the FDIC under Section 165(d) of the Dodd-Frank Act. Through resolution planning, we seek, in the event of our insolvency, to maintain State Street Bank’s role as a key infrastructure provider within the financial system, while minimizing risk to the financial system and maximizing value for the benefit of our stakeholders. We have and will continue to focus management attention and resources to meet regulatory expectations with respect to resolution planning.

We submitted our 2017 resolution plan describing our preferred resolution strategy to the Federal Reserve and FDIC on June 30, 2017. On December 19, 2017, the Federal Reserve and FDIC announced that they had completed their review and had not identified deficiencies or specific shortcomings. Nonetheless, the agencies identified four common areas in which more work may need to be done by all firms, including us, to continue to improve resolvability: intra-group liquidity; internal loss-absorbing capacity; derivatives; and payment, clearing and settlement activities. Our next resolution plan is due July 1, 2019.

In the event of material financial distress or failure, our preferred resolution strategy is the SPOE Strategy. The SPOE Strategy provides that prior to the bankruptcy of the Parent Company and pursuant to a support agreement among the Parent Company, SSIF (a direct subsidiary of the Parent Company), our Beneficiary Entities (as defined below) and certain of our other entities, SSIF is obligated, up to its available resources, to recapitalize and/or provide liquidity to State Street Bank and the other entities benefiting from such capital and/or liquidity support (collectively with State Street Bank, “Beneficiary Entities”), in amounts designed to prevent the Beneficiary Entities from themselves entering into resolution proceedings. Following the recapitalization of, or provision of liquidity to the Beneficiary Entities, the Parent Company would enter into a bankruptcy proceeding under the U.S. Bankruptcy Code. The Beneficiary Entities and our other subsidiaries would be transferred to a newly organized holding company held by a reorganization trust

for the benefit of the Parent Company's claimants.

Under the support agreement, the Parent Company has pre-funded SSIF by contributing certain of its assets (primarily its liquid assets, cash deposits, investments in intercompany debt, investments in marketable securities and other cash and non-cash equivalent investments) to SSIF contemporaneous with entering into the support agreement and will continue to contribute such assets, to the extent available, on an on-going basis. In consideration for these contributions, SSIF has agreed in the support agreement to provide capital and liquidity support to the Parent Company and all of the Beneficiary Entities in accordance with the Parent Company's capital and liquidity policies. Under the support agreement, the Parent Company is only

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permitted to retain cash needed to meet its upcoming obligations and to fund expected expenses during a potential bankruptcy proceeding. SSIF has provided the Parent Company with a committed credit line and issued (and may issue) one or more promissory notes to the Parent Company (the "Parent Company Funding Notes") that together are intended to allow the Parent Company to continue to meet its obligations throughout the period prior to the occurrence of a "Recapitalization Event" (as defined below). The support agreement does not contemplate that SSIF is obligated to maintain any specific level of resources and SSIF may not have sufficient resources to implement the SPOE Strategy.

In the event a Recapitalization Event occurs, the obligations outstanding under the Parent Company Funding Notes would automatically convert into or be exchanged for capital contributed to SSIF. The obligations of the Parent Company and SSIF under the support agreement are secured through a security agreement that grants a lien on the assets that the Parent Company and SSIF would use to fulfill their obligations under the support agreement to the Beneficiary Entities. SSIF is a distinct legal entity separate from the Parent Company and the Parent Company's other affiliates.

In accordance with our policies, we are required to monitor, on an ongoing basis, the capital and liquidity needs of State Street Bank and our other Beneficiary Entities. To support this process, we have established a trigger framework that identifies key actions that would need to be taken or decisions that would need to be made if certain events tied to our financial condition occur. In the event that we experience material financial distress, the support agreement requires us to model and calculate certain capital and liquidity triggers on a regular basis to determine whether or not the Parent Company should commence preparations for a bankruptcy filing and whether or not a Recapitalization Event has occurred.

Upon the occurrence of a Recapitalization Event: (1) SSIF would not be authorized to provide any further liquidity to the Parent Company; (2) the Parent Company would be required to contribute to SSIF any remaining assets it is required to contribute to SSIF under the support agreement (which specifically exclude amounts designated to fund expected expenses during a potential bankruptcy proceeding); (3) SSIF would be required to provide capital and liquidity support to the Beneficiary Entities to support such entities' continued operation to the extent of its available resources and consistent with the support agreement; and (4) the Parent Company would be expected to commence Chapter 11 proceedings under the U.S. Bankruptcy Code. No person or entity, other than a party to the support agreement, should rely, including in evaluating any of our entities from a creditor's perspective or determining whether to enter into a contractual relationship with any of our entities,

on any of our affiliates being or remaining a Beneficiary Entity or receiving capital or liquidity support pursuant to the support agreement.

A "Recapitalization Event" is defined under the support agreement as the earlier occurrence of one or more capital and liquidity thresholds being breached or the authorization by the Parent Company's Board of Directors for the Parent Company to commence bankruptcy proceedings. These thresholds are set at levels intended to provide for the availability of sufficient capital and liquidity to enable an orderly resolution without extraordinary government support. The SPOE Strategy and the obligations under the support agreement may result in the recapitalization of State Street Bank and the commencement of bankruptcy proceedings by the Parent Company at an earlier stage of financial stress than might otherwise occur without such mechanisms in place. An expected effect of the SPOE Strategy and applicable TLAC regulatory requirements is that our losses will be imposed on the Parent Company shareholders and the holders of long-term debt and other forms of TLAC securities currently outstanding or issued in the future by the Parent Company, as well as on any other Parent Company creditors, before any of its losses are imposed on the holders of the debt securities of the Parent Company's operating subsidiaries or any of their depositors or creditors, or before U.S. taxpayers are put at risk.

There can be no assurance that credit rating agencies, in response to our resolution plan or the support agreement, will not downgrade, place on negative watch or change their outlook on our debt credit ratings, generally or on specific debt securities. Any such downgrade, placement on negative watch or change in outlook could adversely affect our cost of borrowing, limit our access to the capital markets or result in restrictive covenants in future debt agreements and could also adversely impact the trading prices, or the liquidity, of our outstanding debt securities.

State Street Bank is also required to submit periodically to the FDIC a plan for resolution in the event of its failure, referred to as an IDI plan. The FDIC's Chairman has indicated that until the FDIC's revisions to its IDI plan requirements are finalized, no IDI plans will be required to be filed.

Orderly Liquidation Authority

Under the Dodd-Frank Act, certain financial companies, including bank holding companies such as us, and certain covered subsidiaries, can be subjected to the orderly liquidation authority. The U.S. Treasury Secretary, in consultation with the U.S. President, must first make certain extraordinary financial distress and systemic risk determinations, and action must be recommended by two-thirds of the FDIC Board and two-thirds of the Federal Reserve Board. Absent such actions, we, as a bank holding company, would remain subject to the U.S. Bankruptcy Code.

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The orderly liquidation authority went into effect in 2010, and rulemaking is proceeding in stages, with some regulations now finalized and others planned but not yet proposed. If we were subject to the orderly liquidation authority, the FDIC would be appointed as the receiver of State Street Bank, which would give the FDIC considerable powers to resolve us, including: (1) the power to remove officers and directors responsible for our failure and to appoint new directors and officers; (2) the power to assign assets and liabilities to a third party or bridge financial company without the need for creditor consent or prior court review; (3) the ability to differentiate among creditors, including by treating junior creditors better than senior creditors, subject to a minimum recovery right to receive at least what they would have received in bankruptcy liquidation; and (4) broad powers to administer the claims process to determine distributions from the assets of the receivership to creditors not transferred to a third party or bridge financial institution.

In 2013, the FDIC released its proposed SPOE strategy for resolution of a SIFI under the orderly liquidation authority. The FDIC's release outlines how it would use its powers under the orderly liquidation authority to resolve a SIFI by placing its top-tier U.S. holding company in receivership and keeping its operating subsidiaries open and out of insolvency proceedings by transferring the operating subsidiaries to a new bridge holding company, recapitalizing the operating subsidiaries and imposing losses on the shareholders and creditors of the holding company in receivership according to their statutory order of priority.

Derivatives

Title VII of the Dodd-Frank Act imposed a comprehensive regulatory structure on the OTC derivatives market, including requirements for clearing, exchange trading, capital, margin, reporting and record-keeping. Title VII also requires certain persons to register as a major swap participant, a swap dealer or a securities-based swap dealer. The CFTC, the SEC, and other U.S. regulators have largely implemented key provisions of Title VII, although certain final regulations have only been in place a short period of time and others have not been finalized. Through this rulemaking process, these regulators collectively have adopted or proposed, among other things, regulations relating to reporting and record-keeping obligations, margin and capital requirements, the scope of registration and the central clearing and exchange trading requirements for certain OTC derivatives. The CFTC has also issued rules to enhance the oversight of clearing and trading entities. The CFTC, along with other regulators, including the Federal Reserve, have also issued final rules with respect to margin requirements for uncleared derivatives transactions.

State Street Bank has registered provisionally with the CFTC as a swap dealer. As a provisionally

registered swap dealer, State Street Bank is subject to significant regulatory obligations regarding its swap activity and the supervision, examination and enforcement powers of the CFTC and other regulators. The CFTC has granted State Street Bank a limited-purpose swap dealer designation. Under this limited-purpose designation, interest rate swap activity engaged in by State Street Bank's Global Treasury group is not subject to certain of the swap regulatory requirements otherwise applicable to swaps entered into by a registered swap dealer, subject to a number of conditions. For all other swap transactions, our swap activities remain subject to all applicable swap dealer regulations.

Subsidiaries

The Federal Reserve is the primary federal banking agency responsible for regulating us and our subsidiaries, including State Street Bank, with respect to both our U.S. and non-U.S. operations.

Our banking subsidiaries are subject to supervision and examination by various regulatory authorities. State Street Bank is a member of the Federal Reserve System, its deposits are insured by the FDIC and it is subject to applicable federal and state banking laws and to supervision and examination by the Federal Reserve, as well as by the Massachusetts Commissioner of Banks, the FDIC, and the regulatory authorities of those states and countries in which State Street Bank operates a branch. Our other subsidiary trust companies are subject to supervision and examination by the OCC, the Federal Reserve or by the appropriate state banking regulatory authorities of the states in which they are organized and operate. Our non-U.S. banking subsidiaries are subject to regulation by the regulatory authorities of the countries in which they operate.

We and our subsidiaries that are not subsidiaries of State Street Bank are affiliates of State Street Bank under federal banking laws, which impose restrictions on various types of transactions, including loans, extensions of credit,

investments or asset purchases by or from State Street Bank, on the one hand, to us and those of our subsidiaries, on the other. Transactions of this kind between State Street Bank and its affiliates are limited with respect to each affiliate to 10% of State Street Bank's capital and surplus, as defined by the aforementioned banking laws, and to 20% in the aggregate for all affiliates, and in some cases are also subject to strict collateral requirements. Derivatives, securities borrowing and securities lending transactions between State Street Bank and its affiliates became subject to these restrictions pursuant to the Dodd-Frank Act. The Dodd-Frank Act also expanded the scope of transactions required to be collateralized. In addition, the Volcker Rule generally prohibits similar transactions between the Parent Company or any of its affiliates and covered funds for which we or any of our affiliates serve

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as the investment manager, investment adviser, commodity trading advisor or sponsor and other covered funds organized and offered pursuant to specific exemptions in the final Volcker Rule regulations. Federal law also requires that certain transactions by a bank with affiliates be on terms and under circumstances, including credit standards, that are substantially the same, or at least as favorable to the bank, as those prevailing at the time for comparable transactions involving other non-affiliated companies. Alternatively, in the absence of comparable transactions, the transactions must be on terms and under circumstances, including credit standards, that in good faith would be offered to, or would apply to, non-affiliated companies. State Street Bank is also prohibited from engaging in certain tie-in arrangements in connection with any extension of credit or lease or sale of property or furnishing of services. Federal law provides for a depositor preference on amounts realized from the liquidation or other resolution of any depository institution insured by the FDIC. Our subsidiaries, State Street Global Advisors FM and State Street Global Advisors Ltd., act as investment advisers to investment companies registered under the Investment Company Act of 1940. State Street Global Advisors FM, incorporated in Massachusetts in 2001 and headquartered in Boston, Massachusetts, is registered with the SEC as an investment adviser under the Investment Advisers Act of 1940 and is registered with the CFTC as a commodity trading adviser and pool operator. State Street Global Advisors Ltd., incorporated in 1990 as a U.K. limited company and domiciled in the U.K., is also registered with the SEC as an investment adviser under the Investment Advisers Act of 1940. State Street Global Advisors Ltd. is also authorized and regulated by the U.K. FCA and is an investment firm under the MiFID. Our subsidiary, State Street Global Advisors Asia Limited, a Hong Kong incorporated company, is registered as an investment adviser with the SEC and additionally is licensed by the Securities and Futures Commission of Hong Kong to perform a variety of activities, including asset management. State Street Global Advisors Asia Limited also holds permits as a qualified foreign institutional Investor (QFII) and a renminbi qualified foreign institutional investor (RQFII), approved by the Securities Regulatory Commission in the People's Republic of China, and in Korea is registered with the Financial Services Commission as a cross-border investment advisory company and a cross-border discretionary investment management company. In addition, a major portion of our investment management activities are conducted by State Street Global Advisors Trust Company, which is a subsidiary of State Street Bank and a Massachusetts chartered trust company subject to the supervision of the Massachusetts

Commissioner of Banks and the Federal Reserve with respect to these activities. Many aspects of our investment management activities are subject to federal and state laws and regulations primarily intended to benefit the investment holder, rather than our shareholders.

These laws and regulations generally grant supervisory agencies and bodies broad administrative powers, including the power to limit or restrict us from conducting our investment management activities in the event that we fail to comply with such laws and regulations, and examination authority. Our business related to investment management and trusteeship of collective trust funds and separate accounts offered to employee benefit plans is subject to ERISA, and is regulated by the U.S. DOL.

We have three subsidiaries that operate as a U.S. broker/dealer and are registered as such with the SEC, are subject to regulation by the SEC (including the SEC's net capital rule) and are members of the Financial Industry Regulatory Authority, a self-regulatory organization. State Street Global Advisors Funds Distributors, LLC operates as a limited purpose broker/dealer that provides distributing and related marketing activities for U.S. mutual funds and ETFs associated with State Street Global Advisors. State Street Global Advisors Funds Distributors, LLC also may privately offer certain State Street Global Advisors advised funds. State Street Global Markets LLC is a U.S. broker/dealer that provides agency execution services. We also acquired Charles River Brokerage, LLC, a U.S. broker/dealer, as part of our acquisition of Charles River Development. In addition, we have a subsidiary, SwapEX, LLC, registered with the CFTC in the U.S. as a swap execution facility.

Our businesses, including our investment management and securities businesses, are also regulated extensively by non-U.S. governments, securities exchanges, self-regulatory organizations, central banks and regulatory bodies, especially in those jurisdictions in which we maintain an office. For instance, among others, the U.K. FCA and the U.K. PRA regulate our activities in the U.K.; the Central Bank of Ireland regulates our activities in Ireland; the

German Federal Financial Supervisory Authority regulates our activities in Germany; the Commission de Surveillance du Secteur Financier regulates our activities in Luxembourg; our German banking group is also subject to direct supervision by the European Central Bank under the ECB Single Supervisory Mechanism; the Securities and Futures Commission regulates our asset management activities in Hong Kong; the Australian Prudential Regulation Authority and the Australian Securities and Investments Commission regulate our activities in Australia; and the Financial Services Agency and the Bank of Japan regulate our activities in Japan. We have established policies, procedures and systems designed to comply with the requirements of

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these organizations. However, as a global financial services institution, we face complexity, costs and risks related to regulation.

The majority of our non-U.S. asset servicing operations are conducted pursuant to the Federal Reserve's Regulation K through State Street Bank's Edge Act subsidiary or through international branches of State Street Bank. An Edge Act corporation is a corporation organized under federal law that conducts foreign business activities. In general, banks may not make investments in their Edge Act corporations (and similar state law corporations) that exceed 20% of their capital and surplus, as defined, and the investment of any amount in excess of 10% of capital and surplus requires the prior approval of the Federal Reserve.

In addition to our non-U.S. operations conducted pursuant to Regulation K, we also make new investments abroad directly (through us or through our non-banking subsidiaries) pursuant to the Federal Reserve's Regulation Y, or through international bank branch expansion, neither of which is subject to the investment limitations applicable to Edge Act subsidiaries.

Additionally, Massachusetts has its own bank holding company statute, under which we, among other things, may be required to obtain prior approval by the Massachusetts Board of Bank Incorporation for an acquisition of more than 5% of any additional bank's voting shares, or for other forms of bank acquisitions.

Anti-Money Laundering and Financial Transparency

We and certain of our subsidiaries are subject to the Bank Secrecy Act of 1970, as amended by the USA PATRIOT Act of 2001, and related regulations, which contain AML and financial transparency provisions and which require implementation of an AML compliance program, including processes for verifying client identification and monitoring client transactions and detecting and reporting suspicious activities. AML laws outside the U.S. contain similar requirements. We have implemented policies, procedures and internal controls that are designed to promote compliance with applicable AML laws and regulations. AML laws and regulations applicable to our operations may be more stringent than similar requirements applicable to our non-regulated competitors or financial institutions principally operating in other jurisdictions. Compliance with applicable AML and related requirements is a common area of review for financial regulators, and any failure by us to comply with these requirements could result in fines, penalties, lawsuits, regulatory sanctions, difficulties in obtaining governmental approvals, restrictions on our business activities or harm to our reputation.

In 2015, we entered into a written agreement with the Federal Reserve and the Massachusetts Division of Banks relating to deficiencies identified in our

compliance programs with the requirements of the Bank Secrecy Act, AML regulations and U.S. economic sanctions regulations promulgated by OFAC. As part of this agreement, we have been required to, among other things, implement improvements to our compliance programs. If we fail to comply with the terms of the written agreement, we may become subject to fines and other regulatory sanctions, which may have a material adverse effect on us.

Deposit Insurance

The Dodd-Frank Act made permanent the general \$250,000 deposit insurance limit for insured deposits. The FDIC's DIF is funded by assessments on FDIC-insured depository institutions. The FDIC assesses DIF premiums based on an insured depository institution's average consolidated total assets, less the average tangible equity of the insured depository institution during the assessment period. For larger institutions, such as State Street Bank, assessments are determined based on regulatory ratings and forward-looking financial measures to calculate the assessment rate, which is subject to adjustments by the FDIC, and the assessment base.

The FDIC is required to determine whether and to what extent adjustments to the assessment base are appropriate for "custody banks" that satisfy specified institutional eligibility criteria. The FDIC has concluded that certain liquid assets could be excluded from the deposit insurance assessment base of custody banks. This has the effect of reducing the amount of DIF insurance premiums due from custody banks. State Street Bank qualifies as a custody bank for this purpose. The custody bank assessment adjustment may not exceed total transaction account deposits identified by the institution as being directly linked to a fiduciary or custody and safekeeping asset.

Prompt Corrective Action

The FDIC Improvement Act of 1991 requires the appropriate federal banking regulator to take “prompt corrective action” with respect to a depository institution if that institution does not meet certain capital adequacy standards, including minimum capital ratios. While these regulations apply only to banks, such as State Street Bank, the Federal Reserve is authorized to take appropriate action against a parent bank holding company, such as our Parent Company, based on the under-capitalized status of any banking subsidiary. In certain instances, we would be required to guarantee the performance of a capital restoration plan if one of our banking subsidiaries were undercapitalized.

Support of Subsidiary Banks

Under Federal Reserve regulations, a bank holding company such as our Parent Company is required to act as a source of financial and managerial strength to its banking subsidiaries. This requirement was added to the Federal Deposit Insurance Act by the

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Dodd-Frank Act. This means that we have a statutory obligation to commit resources to State Street Bank and any other banking subsidiary in circumstances in which we otherwise might not do so absent such a requirement. In the event of bankruptcy, any commitment by us to a federal bank regulatory agency to maintain the capital of a banking subsidiary will be assumed by the bankruptcy trustee and will be entitled to a priority payment.

Insolvency of an Insured U.S. Subsidiary Depository Institution

If the FDIC is appointed the conservator or receiver of an FDIC-insured U.S. subsidiary depository institution, such as State Street Bank, upon its insolvency or certain other events, the FDIC has the ability to transfer any of the depository institution's assets and liabilities to a new obligor without the approval of the depository institution's creditors, enforce the terms of the depository institution's contracts pursuant to their terms or repudiate or disaffirm contracts or leases to which the depository institution is a party. Additionally, the claims of holders of deposit liabilities and certain claims for administrative expenses against an insured depository institution would be afforded priority over other general unsecured claims against such an institution, including claims of debt holders of the institution and, under current interpretation, depositors in non-U.S. branches and offices, in the liquidation or other resolution of such an institution by any receiver. As a result, such persons would be treated differently from and could receive, if anything, substantially less than the depositors in U.S. offices of the depository institution.

ECONOMIC CONDITIONS AND GOVERNMENT POLICIES

Economic policies of the U.S. government and its agencies influence our operating environment. Monetary policy conducted by the Federal Reserve directly affects the level of interest rates, which may affect overall credit conditions of the economy. Monetary policy is applied by the Federal Reserve through open market operations in U.S. government securities, changes in reserve requirements for depository institutions, and changes in the discount rate and availability of borrowing from the Federal Reserve. Government regulation of banks and bank holding companies is intended primarily for the protection of depositors of the banks, rather than for the shareholders of the institutions and therefore may, in some cases, be adverse to the interests of those shareholders. We are similarly affected by the economic policies of non-U.S. government agencies, such as the ECB.

CYBER RISK MANAGEMENT

In October 2016, the Federal Reserve, FDIC and OCC issued an advance notice of proposed rulemaking regarding enhanced cyber risk management standards, which would apply to a wide range of large financial

institutions and their third-party service providers, including us and our banking subsidiaries. The proposed standards would expand existing cybersecurity regulations and guidance to focus on cyber risk governance and management; management of internal and external dependencies; and incident response, cyber resilience and situational awareness. In addition, the proposal contemplates more stringent standards for institutions with systems that are critical to the financial sector.

Further discussion of cyber security risk management is provided in "Information Technology Risk Management" included in our Management's Discussion and Analysis in this Form 10-K.

STATISTICAL DISCLOSURE BY BANK HOLDING COMPANIES

The following information, included under Items 6, 7 and 8 in this Form 10-K, is incorporated by reference herein:

“Selected Financial Data” table (Item 6) - presents return on average common equity, return on average assets, common dividend payout and equity-to-assets ratios.

“Distribution of Average Assets, Liabilities and Shareholders' Equity; Interest Rates and Interest Differential” table (Item 8) - presents consolidated average balance sheet amounts, related fully taxable-equivalent interest earned and paid, related average yields and rates paid and changes in fully taxable-equivalent interest income and interest expense for each major category of interest-earning assets and interest-bearing liabilities.

“Investment Securities” section included in our Management's Discussion and Analysis (Item 7) and Note 3, “Investment Securities,” to the consolidated financial statements (Item 8) - disclose information regarding book values, market values, maturities and weighted-average yields of securities (by category).

“Loans and Leases” section included in our Management's Discussion and Analysis (Item 7) and Note 4, “Loans and Leases,” to the consolidated financial statements (Item 8) - disclose our policy for placing loans and leases on non-accrual status and distribution of loans, loan maturities and sensitivities of loans to changes in interest rates.

“Loans and Leases” and “Cross-Border Outstandings” sections of Management’s Discussion and Analysis (Item 7) - disclose information regarding our cross-border outstandings and other loan concentrations.

“Credit Risk Management” section included in Management’s Discussion and Analysis (Item 7) and Note 4, “Loans and Leases,” to the consolidated financial statements (Item 8) - present the allocation of the allowance for loan and lease losses, and a description of factors which influenced management’s

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judgment in determining amounts of additions or reductions to the allowance, if any, charged or credited to results of operations.

“Distribution of Average Assets, Liabilities and Shareholders’ Equity; Interest Rates and Interest Differential” table (Item 8) - discloses deposit information.

Note 8, “Short-Term Borrowings,” to the consolidated financial statements (Item 8) - discloses information regarding our short-term borrowings.

ITEM 1A. RISK FACTORS

Forward-Looking Statements

This Form 10-K, as well as other reports and proxy materials submitted by us under the Securities Exchange Act of 1934, registration statements filed by us under the Securities Act of 1933, our annual report to shareholders and other public statements we may make, may contain statements (including statements in our Management's Discussion and Analysis included in such reports, as applicable) that are considered “forward-looking statements” within the meaning of U.S. securities laws, including statements about our goals and expectations regarding our business, financial and capital condition, results of operations, strategies, cost savings and transformation initiatives, investment portfolio performance, dividend and stock purchase programs, outcomes of legal proceedings, market growth, acquisitions, joint ventures and divestitures, client growth and new technologies, services and opportunities, as well as industry, governmental, regulatory, economic and market trends, initiatives and developments, the business environment and other matters that do not relate strictly to historical facts.

Terminology such as “plan,” “expect,” “intend,” “objective,” “forecast,” “outlook,” “believe,” “priority,” “anticipate,” “estimate,” “may,” “will,” “trend,” “target,” “strategy” and “goal,” or similar statements or variations of such terms, are intended to identify forward-looking statements, although not all forward-looking statements contain such terms.

Forward-looking statements are subject to various risks and uncertainties, which change over time, are based on management's expectations and assumptions at the time the statements are made, and are not guarantees of future results. Management's expectations and assumptions, and the continued validity of the forward-looking statements, are subject to change due to a broad range of factors affecting the U.S. and global economies, regulatory environment and the equity, debt, currency and other financial markets, as well as factors specific to State Street and its subsidiaries, including State Street Bank. Factors that could cause changes in the expectations or assumptions on which forward-looking statements are based cannot be foreseen with certainty and include,

but are not limited to:

the financial strength of the counterparties with which we or our clients do business and to which we have investment, credit or financial exposures or to which our clients have such exposures as a result of our acting as agent, including as an asset manager or securities lending agent;

increases in the volatility of, or declines in the level of, our NII, changes in the composition or valuation of the assets recorded in our consolidated statement of condition (and our ability to measure the fair value of investment securities) and changes in the manner in which we fund those assets;

the volatility of servicing fee, management fee, trading fee and securities finance revenues due to, among other factors, the value of equity and fixed-income markets, market interest and foreign exchange rates, the volume of client transaction activity, competitive pressures in the investment servicing and asset management industries, and the timing of revenue recognition with respect to processing fees and other revenues;

the liquidity of the U.S. and international securities markets, particularly the markets for fixed-income securities and inter-bank credits; the liquidity of the assets on our balance sheet and changes or volatility in the sources of such funding, particularly the deposits of our clients; and demands upon our liquidity, including the liquidity demands and requirements of our clients;

the level and volatility of interest rates, the valuation of the U.S. dollar relative to other currencies in which we record revenue or accrue expenses and the performance and volatility of securities, credit, currency and other markets in the U.S. and internationally; and the impact of monetary and fiscal policy in the U.S. and internationally on prevailing rates of interest and currency exchange rates in the markets in which we provide services to our clients;

the credit quality, credit-agency ratings and fair values of the securities in our investment securities portfolio, a deterioration or downgrade of which could lead to other-than-temporary impairment of such securities and the recognition of an impairment loss in our consolidated statement of income;

our ability to attract deposits and other low-cost, short-term funding; our ability to manage the level and pricing of such deposits and the relative portion of our deposits that are determined to be operational under regulatory guidelines; and our ability to deploy deposits in a profitable manner consistent with our liquidity needs, regulatory requirements and risk profile;

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the manner and timing with which the Federal Reserve and other U.S. and non-U.S. regulators implement or reevaluate the regulatory framework applicable to our operations (as well as changes to that framework), including implementation or modification of the Dodd-Frank Act and related stress testing and resolution planning requirements, implementation of international standards applicable to financial institutions, such as those proposed by the Basel Committee and European legislation (such as UCITS V, the Money Market Fund Regulation and MiFID II / MiFIR); among other consequences, these regulatory changes impact the levels of regulatory capital, long-term debt and liquidity we must maintain, acceptable levels of credit exposure to third parties, margin requirements applicable to derivatives, restrictions on banking and financial activities and the manner in which we structure and implement our global operations and servicing relationships. In addition, our regulatory posture and related expenses have been and will continue to be affected by heightened standards and changes in regulatory expectations for global systemically important financial institutions applicable to, among other things, risk management, liquidity and capital planning, resolution planning and compliance programs, as well as changes in governmental enforcement approaches to perceived failures to comply with regulatory or legal obligations;

adverse changes in the regulatory ratios that we are, or will be, required to meet, whether arising under the Dodd-Frank Act or implementation of international standards applicable to financial institutions, such as those proposed by the Basel Committee, or due to changes in regulatory positions, practices or regulations in jurisdictions in which we engage in banking activities, including changes in internal or external data, formulae, models, assumptions or other advanced systems used in the calculation of our capital or liquidity ratios that cause changes in those ratios as they are measured from period to period;

requirements to obtain the prior approval or non-objection of the Federal Reserve or other U.S. and non-U.S. regulators for the use, allocation or distribution of our capital or other specific capital actions or corporate activities, including, without limitation, acquisitions, investments in subsidiaries, dividends and stock repurchases, without which our growth plans, distributions to shareholders, share repurchase programs or other capital or corporate initiatives may be restricted;

changes in law or regulation, or the enforcement of law or regulation, that may adversely affect our

business activities or those of our clients or our counterparties, and the products or services that we sell, including, without limitation, additional or increased taxes or assessments thereon, capital adequacy requirements, margin requirements and changes that expose us to risks related to the adequacy of our controls or compliance programs; economic or financial market disruptions in the U.S. or internationally, including those which may result from recessions or political instability; for example, the U.K.'s exit from the European Union or actual or potential changes in trade policy, such as tariffs or bilateral and multilateral trade agreements;

our ability to create cost efficiencies through changes in our operational processes and to further digitize our processes and interfaces with our clients, any failure of which, in whole or in part, may among other things, reduce our competitive position, diminish the cost-effectiveness of our systems and processes or provide an insufficient return on our associated investment;

our ability to promote a strong culture of risk management, operating controls, compliance oversight, ethical behavior and governance that meets our expectations and those of our clients and our regulators, and the financial, regulatory, reputational and other consequences of our failure to meet such expectations;

the impact on our compliance and controls enhancement programs associated with the appointment of a monitor under the deferred prosecution agreement with the DOJ and compliance consultant appointed under a settlement with the SEC, including the potential for such monitor and compliance consultant to require changes to our programs or to identify other issues that require substantial expenditures, changes in our operations, payments to clients or reporting to U.S. authorities;

the results of our review of our billing practices, including additional findings or amounts we may be required to reimburse clients, as well as potential consequences of such review, including damage to our client relationships or our reputation and adverse actions or penalties imposed by governmental authorities;

our ability to expand our use of technology to enhance the efficiency, accuracy and reliability of our operations and our dependencies on information technology; to replace and consolidate systems, particularly those relying upon older

technology, and to adequately incorporate resiliency and business continuity into our systems management; to implement robust management processes into our technology development and maintenance programs; and to

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control risks related to use of technology, including cyber-crime and inadvertent data disclosures;

our ability to address threats to our information technology infrastructure and systems (including those of our third-party service providers), the effectiveness of our and our third party service providers' efforts to manage the resiliency of the systems on which we rely, controls regarding the access to, and integrity of, our and our clients' data, and complexities and costs of protecting the security of such systems and data;

the results of, and costs associated with, governmental or regulatory inquiries and investigations, litigation and similar claims, disputes, or civil or criminal proceedings;

changes or potential changes in the amount of compensation we receive from clients for our services, and the mix of services provided by us that clients choose;

the large institutional clients on which we focus are often able to exert considerable market influence and have diverse investment activities, and this, combined with strong competitive market forces, subjects us to significant pressure to reduce the fees we charge, to potentially significant changes in our AUC/A or our AUM in the event of the acquisition or loss of a client, in whole or in part, and to potentially significant changes in our revenue in the event a client re-balances or changes its investment approach, re-directs assets to lower- or higher-fee asset classes or changes the mix of products or services that it receives from us;

the potential for losses arising from our investments in sponsored investment funds;

the possibility that our clients will incur substantial losses in investment pools for which we act as agent, the possibility of significant reductions in the liquidity or valuation of assets underlying those pools and the potential that clients will seek to hold us liable for such losses; and the possibility that our clients or regulators will assert claims that our fees, with respect to such investment products, are not appropriate;

our ability to anticipate and manage the level and timing of redemptions and withdrawals from our collateral pools and other collective investment products;

the credit agency ratings of our debt and depositary obligations and investor and client perceptions of our financial strength;

adverse publicity, whether specific to us or regarding other industry participants or industry-wide factors, or other reputational harm;

- our ability to control operational risks, data security breach risks and outsourcing risks, our ability to

protect our intellectual property rights, the possibility of errors in the quantitative models we use to manage our business and the possibility that our controls will prove insufficient, fail or be circumvented;

changes or potential changes to the competitive environment, due to, among other things, regulatory and technological changes, the effects of industry consolidation and perceptions of us, as a suitable service provider or counterparty;

our ability to complete acquisitions, joint ventures and divestitures, including, without limitation, our ability to obtain regulatory approvals, the ability to arrange financing as required and the ability to satisfy closing conditions;

the risks that our acquired businesses, including, without limitation, our acquisition of Charles River Development, and joint ventures will not achieve their anticipated financial, operational and product innovation benefits or will not be integrated successfully, or that the integration will take longer than anticipated; that expected synergies will not be achieved or unexpected negative synergies or liabilities will be experienced; that client and deposit retention goals will not be met; that other regulatory or operational challenges will be experienced; and that disruptions from the transaction will harm our relationships with our clients, our employees or regulators;

our ability to integrate Charles River Development's front office software solutions with our middle and back office capabilities to develop a front-to-middle-to-back office platform that is competitive, generates revenues in line with our expectations and meets our clients' requirements;

our ability to recognize evolving needs of our clients and to develop products that are responsive to such trends and profitable to us; the performance of and demand for the products and services we offer; and the potential for new products and services to impose additional costs on us and expose us to increased operational risk;

our ability to grow revenue, manage expenses, attract and retain highly skilled people and raise the capital necessary to achieve our business goals and comply with regulatory requirements and expectations;

- changes in accounting standards and practices; and
- the impact of the U.S. tax legislation enacted in 2017, and changes in tax legislation and in the interpretation of existing tax laws by U.S. and non-U.S. tax authorities that affect the amount of taxes due.

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Actual outcomes and results may differ materially from what is expressed in our forward-looking statements and from our historical financial results due to the factors discussed in this section and elsewhere in this Form 10-K or disclosed in our other SEC filings. Forward-looking statements in this Form 10-K should not be relied on as representing our expectations or assumptions as of any time subsequent to the time this Form 10-K is filed with the SEC. We undertake no obligation to revise our forward-looking statements after the time they are made. The factors discussed herein are not intended to be a complete statement of all risks and uncertainties that may affect our businesses. We cannot anticipate all developments that may adversely affect our business or operations or our consolidated results of operations, financial condition or cash flows.

Forward-looking statements should not be viewed as predictions, and should not be the primary basis on which investors evaluate State Street. Any investor in State Street should consider all risks and uncertainties disclosed in our SEC filings, including our filings under the Securities Exchange Act of 1934, in particular our annual reports on Form 10-K, our quarterly reports on Form 10-Q and our current reports on Form 8-K, or registration statements filed under the Securities Act of 1933, all of which are accessible on the SEC's website at www.sec.gov or on the "Investor Relations" section of our corporate website at www.statestreet.com.

Risk Factors

In the normal course of our business activities, we are exposed to a variety of risks. The following is a discussion of risk factors applicable to us. Additional information about our risk management framework is included under "Risk Management" in Management's Discussion and Analysis in this Form 10-K. Additional risks beyond those described in our Management's Discussion and Analysis or in the following discussion may apply to our activities or operations as currently conducted, or as we may conduct them in the future, or in the markets in which we operate or may in the future operate.

Credit and Counterparty, Liquidity and Market Risks

We assume significant credit risk to counterparties, many of which are major financial institutions. These financial institutions and other counterparties may also have substantial financial dependencies with other financial institutions and sovereign entities. These credit exposures and concentrations could expose us to financial loss.

The financial markets are characterized by extensive interdependencies among numerous parties, including banks, central banks, broker/dealers, insurance companies and other financial institutions.

These financial institutions also include collective investment funds, such as mutual funds, UCITS and hedge funds that share these interdependencies. Many financial institutions, including collective investment funds, also hold, or are exposed to, loans, sovereign debt, fixed-income securities, derivatives, counterparty and other forms of credit risk in amounts that are material to their financial condition. As a result of our own business practices and these interdependencies, we and many of our clients have concentrated counterparty exposure to other financial institutions and collective investment funds, particularly large and complex institutions, sovereign issuers, mutual funds, UCITS and hedge funds. Although we have procedures for monitoring both individual and aggregate counterparty risk, significant individual and aggregate counterparty exposure is inherent in our business, as our focus is on servicing large institutional investors.

In the normal course of our business, we assume concentrated credit risk at the individual obligor, counterparty or group level. Such concentrations may be material and can often exceed 10% of our consolidated total shareholders' equity. Our material counterparty exposures change daily, and the counterparties or groups of related counterparties to which our risk exposure exceeds 10% of our consolidated total shareholders' equity are also variable during any reported period; however, our largest exposures tend to be to other financial institutions.

Concentration of counterparty exposure presents significant risks to us and to our clients because the failure or perceived weakness of our counterparties (or in some cases of our clients' counterparties) has the potential to expose us to risk of financial loss. Changes in market perception of the financial strength of particular financial institutions or sovereign issuers can occur rapidly, are often based on a variety of factors and are difficult to predict.

This was observed during the financial crisis that began in 2007-2008, when economic, market, political and other factors contributed to the perception of many financial institutions and sovereign issuers as being less credit worthy. This led to credit downgrades of numerous large U.S. and non-U.S. financial institutions and several sovereign issuers

(which exposure stressed the perceived creditworthiness of financial institutions, many of which invest in, accept collateral in the form of, or value other transactions based on the debt or other securities issued by sovereigns) and substantially reduced value and liquidity in the market for their credit instruments. These or other factors could again contribute to similar consequences or other market risks associated with reduced levels of liquidity. As a result, we may be exposed to increased counterparty risks, either resulting from our role as principal or because of commitments we make in our capacity as agent for some of our clients.

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Additional areas where we experience exposure to credit risk include:

Short-term credit. The degree of client demand for short-term credit tends to increase during periods of market turbulence, which may expose us to further counterparty- related risks. For example, investors in collective investment vehicles for which we act as custodian may experience significant redemption activity due to adverse market or economic news. Our relationship with our clients and the nature of the settlement process for some types of payments may result in the extension of short-term credit in such circumstances. We also provide committed lines of credit to support such activity. For some types of clients, we provide credit to allow them to leverage their portfolios, which may expose us to potential loss if the client experiences investment losses or other credit difficulties.

Industry and country risks. In addition to our exposure to financial institutions, we are from time to time exposed to concentrated credit risk at an industry or country level. This concentration risk also applies to groups of unrelated counterparties that may have similar investment strategies involving one or more particular industries, regions, or other characteristics. These unrelated counterparties may concurrently experience adverse effects to their performance, liquidity or reputation due to events or other factors affecting such investment strategies. Though potentially not material individually (relative to any one such counterparty), our credit exposures to such a group of counterparties could expose us to a single market or political event or a correlated set of events that, in the aggregate, could have a material adverse impact on our business.

Subcustodian risks. Our use of unaffiliated subcustodians exposes us to credit risk, in addition to other risks, such as operational risk, dependencies on credit extensions and risks of the legal systems of the jurisdictions in which the subcustodians operate, each of which may be material. Our operating model exposes us to risk of unaffiliated sub-custodians to a degree greater than some of our competitors who have banking operations in more jurisdictions than us. Our sub-custodians operate in all jurisdictions in which our clients invest, including emerging and other underdeveloped markets that entail heightened risks. These risks are amplified due to changing regulatory requirements with respect to our financial exposures in the event those subcustodians are unable to return a client's assets, including,

in some regulatory regimes, such as the E.U.'s UCITS V directive, requirements that we be responsible for resulting losses suffered by our clients. We may agree to similar or more stringent standards with clients that are not subject to such regulations.

Settlement risks. We are exposed to settlement risks, particularly in our payments and foreign exchange activities. Those activities may lead to extension of credit and consequent losses in the event of a counterparty breach, failure to provide credit extensions or an operational error. Due to our membership in several industry clearing or settlement exchanges, we may be required to guarantee obligations and liabilities, or provide financial support, in the event that other members do not honor their obligations or default. Moreover, not all of our counterparty exposure is secured, and even when our exposure is secured, the realizable value of the collateral may have declined by the time we exercise our rights against that collateral. This risk may be particularly acute if we are required to sell the collateral into an illiquid or temporarily-impaired market or with respect to clients protected by sovereign immunity. We are exposed to risk of short-term credit or overdraft of our clients in connection with the process to facilitate settlement of trades and related foreign exchange activities, particularly when contractual settlement has been agreed with our clients. The occurrence of overdrafts at peak volatility could create significant credit exposure to our clients depending upon the value of such clients' collateral at the time.

Securities lending and repurchase agreement indemnification. On behalf of clients enrolled in our securities lending program, we lend securities to banks, broker/dealers and other institutions. In the event of a failure of the borrower to return such securities, we typically agree to indemnify our clients for the amount by which the fair market value of those securities exceeds the proceeds of the disposition of the collateral recalled from the borrower in connection with such transaction. We also lend and borrow securities as riskless principal, and in connection with those transactions receive a security interest in securities held by the borrowers in their securities portfolios and advance cash or securities as collateral to securities lenders. Borrowers are generally required to provide collateral equal to a contractually agreed percentage equal to or in excess of the fair market value of the loaned securities. As the fair

market value of the loaned securities or

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collateral changes, additional collateral is provided by the borrower or collateral is returned to the borrower. In addition, our agency securities lending clients often purchase securities or other financial instruments from financial counterparties, including broker/dealers, under repurchase arrangements, frequently as a method of reinvesting the cash collateral they receive from lending their securities. Under these arrangements, the counterparty is obligated to repurchase these securities or financial instruments from the client at the same price (plus an agreed rate of return) at some point in the future. The value of the collateral is intended to exceed the counterparty's payment obligation, and collateral is adjusted daily to account for shortfall under, or excess over, the agreed-upon collateralization level. As with the securities lending program, we agree to indemnify our clients from any loss that would arise on a default by the counterparty under these repurchase arrangements if the proceeds from the disposition of the securities or other financial assets held as collateral are less than the amount of the repayment obligation by the client's counterparty. In such instances of counterparty default, for both securities lending and repurchase agreements, we, rather than our client, are exposed to the risks associated with collateral value.

Stable value arrangements. We enter into stable value wrap derivative contracts with unaffiliated stable value funds that allow a stable value fund to provide book value coverage to its participants. During the financial crisis, the book value of obligations under many of these contracts exceeded the market value of the underlying portfolio holdings. Concerns regarding the portfolio of investments protected by such contracts, or regarding the investment manager overseeing such an investment option, may result in redemption demands from stable value products covered by benefit-responsive contracts at a time when the portfolio's market value is less than its book value, potentially exposing us to risk of loss.

U.S. municipal obligations remarketing credit facilities. We provide credit facilities in connection with the remarketing of U.S. municipal obligations, potentially exposing us to credit exposure to the municipalities issuing such bonds and contingent liquidity risk.

Senior secured bank loans. In recent years, we have increased our investment in senior secured bank loans, both in the U.S. and in Europe. We invest in these loans to non-investment grade borrowers through

participation in loan syndications in the non-investment grade lending market. We rate these loans as "speculative" under our internal risk-rating framework, and these loans have significant exposure to credit losses relative to higher-rated loans. We are therefore at a higher risk of default with respect to these investments relative to other of our investments activities. In addition, unlike other financial institutions that may have an active role in managing individual loan compliance, our investment in these loans is generally as a passive investor with limited control. As this portfolio grows and becomes more seasoned, our allowance for loan losses related to these loans may increase through additional provisions for credit losses.

Commercial Real Estate. We have recently launched an initiative financing commercial and multi-family properties, which serve as collateral for our loans. Although collateralized, these loans may become under-secured if the value of the collateral was over-estimated or changes. Loan payments are dependent on the successful operation and management of the underlying collateral property to generate sufficient cash flow to repay the loan in a timely fashion. A material decline in real estate markets or economic conditions could negatively impact value or property performance, which could adversely impact timely loan repayment, which may result in increased provision for losses on loans, and actual losses, either of which would have an adverse impact on our net income. We seek to minimize these risks by maintaining lending policies and procedures and underwriting standards, however, there can be no assurance that these will protect us from credit-related losses or delinquencies.

Unavailability of netting. We are generally not able to net exposures across counterparties that are affiliated entities and may not be able in all circumstances to net exposures to the same legal entity across multiple products. As a consequence, we may incur a loss in relation to one entity or product even though our exposure to an entity's affiliates or across product types is over-collateralized. In some cases, for example in our securities finance and foreign exchange activities, we are able to enter into netting agreements that allow us to net offsetting exposures and payment obligations against one another. In the event we become unable, due to operational constraints, actions by regulators, changes in accounting principles, law or regulation (or related interpretations) or other factors, to net some or all of

our offsetting exposures and payment

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obligations under those agreements, we would be required to gross up our assets and liabilities on our statement of condition and our calculation of RWA, accordingly. This would result in a potentially material increase in our regulatory ratios, including LCR, and present increased credit, liquidity, asset-and-liability management and operational risks, some of which could be material.

Under evolving regulatory restrictions on credit exposure we may be required to limit our exposures to specific issuers or counterparties or groups of counterparties, including, without limitation, financial institutions and sovereign issuers, to levels that we may currently exceed. These credit exposure restrictions under such evolving regulations have and may further adversely affect certain of our businesses, may require that we expand our credit exposure to a broader range of issuers and counterparties, including issuers and counterparties that represent increased credit risk and may require that we modify our operating models or the policies and practices we use to manage our consolidated statement of condition. The effects of these considerations may increase when evaluated under a stressed environment in stress testing, including CCAR. In addition, we are an adherent to the ISDA 2015 Universal Resolution Stay Protocol and as such are subject to restrictions against the exercise of rights and remedies against fellow adherents, including, without limitation, other major financial institutions, in the event they or an affiliate of theirs enters into resolution. Although our overall business is subject to these factors, several of our activities are particularly sensitive to them including, without limitation, our currency trading business and our securities finance business.

Given the limited number of strong counterparties in the current market, we are not able to mitigate all of our and our clients' counterparty credit risk.

Our investment securities portfolio, consolidated financial condition and consolidated results of operations could be adversely affected by changes in market factors including, without limitation, interest rates, credit spreads and credit performance.

Our investment securities portfolio represented approximately 36% of our total assets as of December 31, 2018. The gross interest income associated with our investment portfolio represented approximately 13% of our total gross revenue for the year ended December 31, 2018 and has represented as much as 31% of our total gross revenue in the fiscal years since 2007. As such, our consolidated financial condition and results of operations are materially exposed to the risks associated with our investment portfolio, including, without limitation, changes in interest rates, credit spreads, credit performance (including, without

limitation, risk of default), credit ratings, our access to liquidity, foreign exchange markets and mark- to-market valuations, and our ability to profitably manage changes in repayment rates of principal with respect to our portfolio securities. Despite recent increases to interest rates in the U.S., the continued low interest rate environment that has persisted since the financial crisis began in mid-2007 limits our ability to achieve a NIM consistent with our historical averages. Any further increases in interest rates in the U.S. have the potential to improve NII and NIM over time. However, any such improvement could be mitigated due to a greater disparity between interest rates in the U.S. and international markets, especially to the extent that interest rates remain low in Europe and Japan. Higher interest rates could also reduce mark-to-market valuations further. In addition, recently introduced regulatory liquidity standards, such as the LCR, require that we maintain minimum levels of HQLA in our investment portfolio, which generally generate lower rates of return than other investment assets. This has resulted in increased levels of HQLA as a percentage of our investment portfolio and an associated negative impact on our NII and our NIM. As a result we may not be able to attain our historical levels of NII and NIM. For additional information regarding these liquidity requirements, refer to the "Liquidity Coverage Ratio and Net Stable Funding Ratio" section of "Supervision and Regulation" in Business in this Form 10-K. We may enter into derivative transactions to hedge or manage our exposure to interest rate risk, as well as other risks, such as foreign exchange risk and credit risk. Derivative instruments that we hold for these or other purposes may not achieve their intended results and could result in unexpected losses or stresses on our liquidity or capital resources.

Our investment securities portfolio represents a greater proportion of our consolidated statement of condition and our loan and lease portfolios represent a smaller proportion (approximately 11% of our total assets as of December 31, 2018), in comparison to many other major financial institutions. In some respects, the accounting and regulatory treatment of our investment securities portfolio may be less favorable to us than a more traditional held-for-investment

lending portfolio. For example, under the Basel III final rule, after-tax changes in the fair value of AFS investment securities, such as those which represent a majority of our investment portfolio, are included in tier 1 capital. Since loans held for investment are not subject to a fair value accounting framework, changes in the fair value of loans (other than incurred credit losses) are not similarly included in the determination of tier 1 capital under the Basel III final rule. Due to this differing treatment, we may experience increased variability in our tier 1 capital relative to other major financial institutions whose loan-and-lease portfolios represent a larger proportion of their

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consolidated total assets than ours.

Additional risks associated with our investment portfolio include:

- Asset class concentration. Our investment portfolio continues to have significant concentrations in several classes of securities, including, without limitation, agency residential MBS, commercial MBS and other ABS, and securities with concentrated exposure to consumers. These classes and types of securities experienced significant liquidity, valuation and credit quality deterioration during the financial crisis that began in mid-2007. We also hold non-U.S. MBS and ABS with exposures to European countries, whose sovereign-debt markets have experienced increased stress at times since 2011 and may continue to experience stress in the future. For further information, refer to the risk factor titled "Our businesses have significant European operations, and disruptions in European economies could have an adverse effect on our consolidated results of operations or financial condition". Further, we hold a portfolio of U.S. state and municipal bonds, the value of which may be affected by the budget deficits that a number of states and municipalities currently face, resulting in risks associated with this portfolio.

Effects of market conditions. If market conditions deteriorate, our investment portfolio could experience a decline in market value, whether due to a decline in liquidity or an increase in the yield required by investors to hold such securities, regardless of our credit view of our portfolio holdings. For example, we recorded significant losses not related to credit in connection with the consolidation of our off-balance sheet asset-backed commercial paper conduits in 2009 and the repositioning of our investment portfolio in 2010. In addition, in general, deterioration in credit quality, or changes in management's expectations regarding repayment timing or in management's investment intent to hold securities to maturity, in each case with respect to our portfolio holdings, could result in OTTI. Similarly, if a material portion of our investment portfolio were to experience credit deterioration, our capital ratios as calculated pursuant to the Basel III final rule could be adversely affected. This risk is greater with portfolios of investment securities that contain credit risk than with holdings of U.S. Treasury securities.

Effects of interest rates. Our investment portfolio is further subject to changes in both U.S. and non-U.S. (primarily in Europe) interest

rates, and could be negatively affected by changes in those rates, whether or not expected. This is particularly true in the case of a quicker-than-anticipated increase in interest rates, which would decrease market values in the near-term, or monetary policy that results in persistently low or negative rates of interest on certain investments. The latter has been the case, for example, with respect to ECB monetary policy, including negative interest rates in some jurisdictions, with associated negative effects on our investment portfolio reinvestment, NII and NIM. The effect on our NII has been exacerbated by the effects in recent fiscal years of the strong U.S. dollar relative to other currencies, particularly the Euro. If European interest rates remain low or decrease and the U.S. dollar strengthens relative to the Euro, the negative effects on our NII likely will continue or increase. The overall level of NII can also be impacted by the size of our deposit base, as further increases in interest rates could lead to reduced deposit levels and also lower overall NII. Further, a reduction in deposit levels could increase the requirements under the regulatory liquidity standards requiring us to invest a greater proportion of our investment portfolio holdings in HQLA that have lower yields than other investable assets. See also, "Our business activities expose us to interest rate risk" in this section. Our business activities expose us to interest rate risk.

In our business activities, we assume interest rate risk by investing short-term deposits received from our clients in our investment portfolio of longer- and intermediate-term assets. Our NII and NIM are affected by among other things, the levels of interest rates in global markets, changes in the relationship between short- and long-term interest rates, the direction and speed of interest rate changes and the asset and liability spreads relative to the currency and geographic mix of our interest-earning assets and interest-bearing liabilities. These factors are influenced, among other things, by a variety of economic and market forces and expectations, including, without limitation, monetary policy and other activities of central banks, such as the Federal Reserve and ECB, that we do not control. Our ability to anticipate changes in these factors or to hedge the related on- and off-balance sheet exposures, and the cost of any such hedging activity, can significantly influence the success of our asset-and-liability management activities and the resulting level of our NII and NIM. The impact of changes in interest rates and related factors will depend on the relative duration

and fixed- or floating-rate nature of our assets and liabilities. Sustained lower interest rates, a flat or inverted yield

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curve and narrow credit spreads generally have a constraining effect on our NII. In addition, our ability to change deposit rates in response to changes in interest rates and other market and related factors is limited by client relationship considerations. For additional information about the effects on interest rates on our business, refer to the Market Risk Management section, "Asset-and-Liability Management Activities" in our Management's Discussion and Analysis in this Form 10-K.

If we are unable to effectively manage our liquidity, including by continuously attracting deposits and other short-term funding, our consolidated financial condition, including our regulatory capital ratios, our consolidated results of operations and our business prospects, could be adversely affected.

Liquidity management, including on an intra-day basis, is critical to the management of our consolidated statement of condition and to our ability to service our client base. We generally use our liquidity to:

- meet clients' demands for return of their deposits;
- extend credit to our clients in connection with our investor services businesses; and
- fund the pool of long- and intermediate-term assets that are included in the investment securities carried in our consolidated statement of condition.

Because the demand for credit by our clients, particularly settlement related extensions of credit, is difficult to predict and control, and may be at its peak at times of disruption in the securities markets, and because the average maturity of our investment securities portfolio is longer than the contractual maturity of our client deposit base, we need to continuously attract, and are dependent on access to, various sources of short-term funding. During periods of market disruption, the level of client deposits held by us has in recent years tended to increase; however, since such deposits are considered to be transitory, we have historically deposited so-called excess deposits with U.S. and non-U.S. central banks and in other highly liquid but low-yielding instruments. These levels of excess client deposits, as a consequence, have increased our NII but have adversely affected our NIM.

In managing our liquidity, our primary source of short-term funding is client deposits, which are predominantly transaction-based deposits by institutional investors. Our ability to continue to attract these deposits, and other short-term funding sources such as certificates of deposit, is subject to variability based on a number of factors, including, without limitation, volume and volatility in global financial markets, the relative interest rates that we are prepared to pay for these deposits, the perception of safety of these deposits or short-term obligations relative to

alternative short-term investments available to our clients, including, without limitation, the capital markets, and the classification of certain deposits for regulatory purposes and related discussions we may have from time to time with clients regarding better balancing our clients' cash management needs with our economic and regulatory objectives.

The Parent Company is a non-operating holding company and generally maintains only limited cash and other liquid resources at any time primarily to meet anticipated near-term obligations. To effectively manage our liquidity we routinely transfer assets among affiliated entities, subsidiaries and branches. Internal or external factors, such as regulatory requirements and standards, including, without limitation, resolution planning, influence our liquidity management and may limit our ability to effectively transfer liquidity internally which could, among other things, restrict our ability to fund operations, dividends or stock repurchases, require us to seek external and potentially more costly capital and impact our liquidity position.

In addition, while not obligations of ours, the investment products that we manage for third parties may be exposed to liquidity risks. These products may be funded on a short-term basis, or the clients participating in these products may have a right to the return of cash or assets on limited notice. These business activities include, among others, securities finance collateral pools, money market and other short-term investment funds and liquidity facilities utilized in connection with municipal bond programs. If clients demand a return of their cash or assets, particularly on limited notice, and these investment pools do not have the liquidity to support those demands, we could be forced to sell investment securities held by these asset pools at unfavorable prices, damaging our reputation as an asset manager and potentially exposing us to claims related to our management of the pools.

The availability and cost of credit in short-term markets are highly dependent on the markets' perception of our liquidity and creditworthiness. Our efforts to monitor and manage our liquidity risk, including on an intra-day basis, may not be successful or sufficient to deal with dramatic or unanticipated changes in the global securities markets or

other event-driven reductions in liquidity. As a result of such events, among other things, our cost of funds may increase, thereby reducing our NII, or we may need to dispose of a portion of our investment securities portfolio, which, depending on market conditions, could result in a loss from such sales of investment securities being recorded in our consolidated statement of income.

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Our business and capital-related activities, including our ability to return capital to shareholders and repurchase our capital stock, may be adversely affected by our implementation of regulatory capital and liquidity standards that we must meet or in the event our capital plan or post-stress capital ratios are determined to be insufficient as a result of regulatory capital stress testing.

Basel III and Dodd-Frank Act

We are required to calculate our risk-based capital ratios under both the Basel III advanced approaches and the Basel III standardized approach, and we are subject to the more stringent of the risk-based capital ratios calculated under the advanced approaches and those calculated under the standardized approach in the assessment of our capital adequacy. In implementing various aspects of these capital regulations, we are making interpretations of the regulatory intent. The Federal Reserve may determine that we are not in compliance with the capital rules and may require us to take actions to come into compliance that could adversely affect our business operations, our regulatory capital structure, our capital ratios or our financial performance, or otherwise restrict our growth plans or strategies. In addition, banking regulators could change the Basel III final rule or their interpretations as they apply to us, including, without limitation, changes to these standards or interpretations made in regulations implementing provisions of the Dodd-Frank Act, which could adversely affect us and our ability to comply with the Basel III final rule.

Along with the Basel III final rule, banking regulators also introduced additional requirements, such as the SLR, LCR and the proposed NSFR, each of which presents compliance risks.

For example, the specification of the various elements of the NSFR in the final rule could have a material effect on our business activities, including, without limitation, the management and composition of our investment securities portfolio and our ability to extend credit through committed facilities, loans to our clients or our principal securities lending activities. In addition, further capital and liquidity requirements are under consideration by U.S. and international banking regulators. Any of these rules could have a material effect on our capital and liquidity planning and related activities, including, without limitation, the management and composition of our investment securities portfolio and our ability to extend committed contingent credit facilities to our clients. The full effects of these rules, and of other regulatory initiatives related to capital or liquidity, on us and State Street Bank are subject to further regulatory guidance, action or rule-making.

Systemic Importance

As a G-SIB, we generally expect to be held to the most stringent provisions under the Basel III final rule. For example, we are subject to the Federal Reserve's final rules on the implementation of capital surcharges for U.S. G-SIBs, and on TLAC, LTD and clean holding company requirements for U.S. G-SIBs which we refer to as the "TLAC final rule". For additional information on these requirements, refer to the "Regulatory Capital Adequacy and Liquidity Standards" section under "Supervision and Regulation" in Business in this Form 10-K.

Not all of our competitors have similarly been designated as systemically important nor are all of them subject to the same degree of regulation as a bank or financial holding company, and therefore some of our competitors are not subject to the same additional capital requirements.

Comprehensive Capital Analysis and Review

We are required by the Federal Reserve to conduct periodic stress testing of our business operations and to develop an annual capital plan as part of the Federal Reserve's CCAR process. That process, the severity and other characteristics of which may evolve from year-to-year, is used by the Federal Reserve to evaluate our management of capital, the adequacy of our regulatory capital and the requirement for us to maintain capital above our minimum regulatory capital requirements under stressed economic conditions. The results of the CCAR process are difficult to predict due, among other things, to the Federal Reserve's use of proprietary stress models that differ from our internal models. The amounts of the planned capital actions in our capital plan in any year, including, without limitation, stock repurchases and dividends, may be substantially reduced from the amounts included in prior capital plans. These reductions may reflect changes in one or more different factors, including, without limitation, our business prospects and related capital needs, our capital position, proposed acquisitions or other uses of capital, the models used in our capital planning process, the supervisory models used by the Federal Reserve to stress our balance sheet, the Federal Reserve's hypothetical economic scenarios for the CCAR process, the Federal Reserve's CCAR instructions and the

Federal Reserve's supervisory expectations for the capital planning process. The Federal Reserve may object to our capital plan or impose conditions on us in connection with a non-objection to our capital plan, or we may decide that we need to adjust our capital plan to avoid an objection by the Federal Reserve. Any of these potential events potentially could require us, as applicable, to revise our stress-testing or capital management approaches, resubmit our capital plan or postpone, cancel or alter our planned capital actions. In addition, changes in our business strategy, merger or acquisition activity or uses

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of capital could result in a change in our capital plan and its associated capital actions, and may require us to resubmit our capital plan to the Federal Reserve for its non-objection. We are also subject to asset quality reviews and stress testing by the ECB and in the future we may be subject to similar reviews and testing by other regulators.

Our implementation of capital and liquidity requirements, including our capital plan, may not be approved or may be objected to by the Federal Reserve, and the Federal Reserve may impose capital requirements in excess of our expectations or require us to maintain levels of liquidity that are higher than we may expect and which may adversely affect our consolidated revenues. In the event that our implementation of capital and liquidity requirements under regulatory initiatives or our current capital structure are determined not to conform with current and future capital requirements, our ability to deploy capital in the operation of our business or our ability to distribute capital to shareholders or to repurchase our capital stock may be constrained, and our business may be adversely affected. In addition, we may choose to forgo business opportunities, due to their impact on our capital plan or stress tests, including, without limitation, CCAR. Likewise, in the event that regulators in other jurisdictions in which we have banking subsidiaries determine that our capital or liquidity levels do not conform with current and future regulatory requirements, our ability to deploy capital, our levels of liquidity or our business operations in those jurisdictions may be adversely affected.

For additional information about the above matters, refer to “Regulatory Capital Adequacy and Liquidity Standards” section under "Supervision and Regulation" in Business and “Capital” section under "Financial Condition" in our Management's Discussion and Analysis in this Form 10-K.

Fee revenue represents a significant majority of our consolidated revenue and is subject to decline, among other things, in the event of a reduction in, or changes to, the level or type of investment activity by our clients.

We rely primarily on fee-based services to derive our revenue. This contrasts with commercial banks that may rely more heavily on interest-based sources of revenue, such as loans. During 2018 total fee revenue represented approximately 78% of our total revenue. Fee revenue generated by our Investment Servicing and Investment Management businesses is augmented by foreign exchange trading services, securities finance and processing fees and other revenue.

The level of these fees is influenced by several factors, including, without limitation, the mix and volume of our AUC/A and our AUM, the value and type of securities positions held (with respect to assets under custody) and the volume of our clients' portfolio

transactions, and the types of products and services used by our clients. For example, reductions in the level of economic and capital markets activity tend to have a negative effect on our fee revenue, as these often result in reduced asset valuations and transaction volumes. They may also result in investor preference trends towards asset classes and markets deemed more secure, such as cash or non-emerging markets, with respect to which our fee rates are often lower.

In addition, our clients include institutional investors, such as mutual funds, collective investment funds, UCITS, hedge funds and other investment pools, corporate and public retirement plans, insurance companies, foundations, endowments and investment managers. Economic, market or other factors that reduce the level or rates of savings in or with those institutions, either through reductions in financial asset valuations or through changes in investor preferences, could materially reduce our fee revenue and have a material adverse effect on our consolidated results of operations.

Our businesses have significant European operations, and disruptions in European economies could have an adverse effect on our consolidated results of operations or financial condition.

While the European economy continued to expand in 2018, growth moderated from 2017 levels and concerns remain with regard to sovereign debt sustainability, interdependencies among financial institutions and sovereigns, the unwinding of ECB quantitative easing measures and political and other risks, including the rise of populist governments and terrorist threats in one or more European nations. In addition, continued divergence between the pace of monetary tightening in the U.S. and Europe, as well as the weakening of the external environment for Europe, specifically with regard to weaker external trade, have led to increased uncertainty around the sustainability of recent economic progress in Europe.

In addition, the United Kingdom's potential exit from the E.U., or Brexit, and related developments present risks, including the potential impact on economic activity in the E.U. and the U.K. and the future relationship between the E.U. and the U.K. and the resulting arrangements around market access for financial services. Given the scope of our European operations, economic or market uncertainty, volatility, illiquidity or disruption resulting from these and related factors could have a material adverse impact on our consolidated results of operations or financial condition. In order to conform to restrictions on activity between the E.U. and the U.K. following Brexit, we are implementing organizational, operational and governance changes to our European businesses, some of which are subject to regulatory approvals or other execution risks. If we experience delays or other

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challenges in implementing these changes, we may incur additional costs or inefficiencies associated with our European activities, client dissatisfaction or other difficulties in executing our regional strategy.

Geopolitical and economic conditions and developments could adversely affect us, particularly if we face increased uncertainty and unpredictability in managing our businesses.

Global financial markets can suffer from substantial volatility, illiquidity and disruption, particularly as a result of geopolitical disruptions and as global monetary authorities begin to withdraw monetary policy easing measures. If such volatility, illiquidity or disruption were to result in an adverse economic environment in the U.S. or internationally or result in a lack of confidence in the financial stability of major developed or emerging markets, such developments could have an adverse effect on our business, as well as the businesses of our clients and our significant counterparties and could also increase the difficulty and unpredictability of aligning our business strategies, our infrastructure and our operating costs in light of current and future market and economic conditions. These risks could be compounded by tighter monetary conditions, disruptions to free trade and political uncertainty in the U.S. and internationally.

Market disruptions can adversely affect our consolidated results of operations if the value of our AUC/A or AUM decline, while the costs of providing the related services remain constant or increase. These factors could reduce the profitability of our asset-based fee revenue and could also adversely affect our transaction-based revenue, such as revenues from securities finance and foreign exchange activities, and the volume of transactions that we execute for or with our clients. Further, the degree of volatility in foreign exchange rates can affect our foreign exchange trading revenue. In general, increased currency volatility tends to increase our market risk but also increases our opportunity to generate foreign exchange revenue. Conversely, periods of lower currency volatility tend to decrease our market risk but also decrease our foreign exchange revenue.

In addition, as our business grows globally and a significant percentage of our revenue is earned (and of our expenses paid) in currencies other than U.S. dollars, our exposure to foreign currency volatility could affect our levels of consolidated revenue, our consolidated expenses and our consolidated results of operations, as well as the value of our investment in our non-U.S. operations and our non-U.S. investment portfolio holdings. The extent to which changes in the strength of the U.S. dollar relative to other currencies affect our consolidated results of operations, including, without limitation, the degree of any offset between increases or decreases to both revenue and expenses, will depend upon the nature and scope of our operations

and activities in the relevant jurisdictions during the relevant periods, which may vary from period to period.

As our product offerings expand, in part as we seek to take advantage of perceived opportunities arising under various regulatory reforms and resulting market changes, the degree of our exposure to various market and credit risks will evolve, potentially resulting in greater revenue volatility. We also will need to make additional investments to develop the operational infrastructure and to enhance our compliance and risk management capabilities to support these businesses, which may increase the operating expenses of such businesses or, if our control environment fails to keep pace with product expansion, result in increased risk of loss from such businesses.

We may need to raise additional capital or debt in the future, which may not be available to us or may only be available on unfavorable terms.

We may need to raise additional capital in order to maintain our credit ratings, in response to regulatory changes, including capital rules, or for other purposes, including, without limitation, financing acquisitions and joint ventures. For example, in December 2018, we issued additional long-term debt in order to meet requirements under the Federal Reserve's TLAC final rule, and in September 2018 and July 2018 we issued preferred stock and common stock, respectively, to finance our acquisition of Charles River Development.

However, our ability to access the capital markets, if needed, on a timely basis or at all will depend on a number of factors, such as the state of the financial markets and securities law requirements and standards. In the event of rising interest rates, disruptions in financial markets, negative perceptions of our business or our financial strength, or other factors that would increase our cost of borrowing, we cannot be sure of our ability to raise additional capital, if needed, on terms acceptable to us. Any diminished ability to raise additional capital, if needed, could adversely affect our business and our ability to implement our business plan, capital plan and strategic goals, including, without

limitation, the financing of acquisitions and joint ventures and our efforts to maintain regulatory compliance. Any downgrades in our credit ratings, or an actual or perceived reduction in our financial strength, could adversely affect our borrowing costs, capital costs and liquidity position and cause reputational harm. Major independent rating agencies publish credit ratings for our debt obligations based on their evaluation of a number of factors, some of which relate to our performance and other corporate developments, including, without limitation, financings, acquisitions and joint ventures, and some of which relate to general industry conditions. We anticipate that the rating agencies will continue to review our ratings regularly

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based on our consolidated results of operations and developments in our businesses, including, without limitation, regulatory considerations such as resolution planning. One or more of the major independent credit rating agencies have in the past downgraded, and may in the future downgrade, our credit ratings, or have negatively revised their outlook for our credit ratings. The current market and regulatory environment and our exposure to financial institutions and other counterparties, including, without limitation, sovereign entities, increase the risk that we may not maintain our current ratings, and we cannot provide assurance that we will continue to maintain our current credit ratings. Downgrades in our credit ratings may adversely affect our borrowing costs, our capital costs and our ability to raise capital and, in turn, our liquidity. A failure to maintain an acceptable credit rating may also preclude us from being competitive in various products.

Additionally, our counterparties, as well as our clients, rely on our financial strength and stability and evaluate the risks of doing business with us. If we experience diminished financial strength or stability, actual or perceived, due to, including, without limitation, the effects of market or regulatory developments, announced or rumored business developments, consolidated results of operations, a decline in our stock price or a downgrade to our credit rating, our counterparties may be less willing to enter into transactions, secured or unsecured, with us; our clients may reduce or place limits on the level of service we provide to them or seek to transfer the business, in whole or in part, to other service providers; or our prospective clients may select other service providers, all of which may have adverse effects on our business and reputation.

The risk that we may be perceived as less creditworthy than other market participants is higher as a result of recent market developments which include, without limitation, an environment in which the consolidation, and in some instances failure, of financial institutions, including major global financial institutions, has resulted in a smaller number of much larger counterparties and competitors. If our counterparties perceive us to be a less viable counterparty, our ability to enter into financial transactions on terms acceptable to us or our clients, on our or our clients' behalf, will be materially compromised. If our clients reduce their deposits with us or select other service providers for all or a portion of the services we provide to them, our revenues will decrease accordingly.

Operational, Business and Reputational Risks

We face extensive and changing government regulation in the U.S. and in non-U.S. jurisdictions in which we operate, which may increase our costs and expose us to risks related to compliance.

Most of our businesses are subject to extensive regulation by multiple regulatory bodies, and many of the clients to which we provide services are themselves subject to a broad range of regulatory requirements. These regulations may affect the scope of, and the manner and terms of delivery of, our services. As a financial institution with substantial international operations, we are subject to extensive regulation and supervisory oversight, both inside and outside of the U.S. This regulation and supervisory oversight affects, among other things, the scope of our activities and client services, our capital and organizational structure, our ability to fund the operations of our subsidiaries, our lending practices, our dividend policy, our common stock purchase actions, the manner in which we market our services, our acquisition activities and our interactions with foreign regulatory agencies and officials.

In particular, we are registered with the Federal Reserve as a bank holding company pursuant to the Bank Holding Company Act of 1956. The Bank Holding Company Act generally limits the activities in which we and our non-banking subsidiaries may engage to managing or controlling banks and to activities considered to be closely related to banking. As a bank holding company that has elected to be treated as a financial holding company under the Bank Holding Company Act, we and some of our non-banking subsidiaries may also engage in a broader range of activities considered to be “financial in nature.” Financial holding company status may be denied if we and our banking subsidiaries do not remain well capitalized and well managed or fail to comply with Community Reinvestment Act obligations. Currently, under the Bank Holding Company Act, we may not be able to engage in new activities or acquire shares or control of other businesses.

The U.S. President issued an executive order that sets forth principles for the reform of the federal financial regulatory framework, and, in May 2018, the United States enacted EGRRCPA. The EGRRCPA's revisions to the U.S. financial regulatory framework, some of which remain subject to further rulemaking, have altered certain laws and regulations applicable to us and other major financial firms. It is too early to assess whether there will be any more changes to the

regulatory environment or further rebalancing of the post financial crisis framework and what the impact will be on our results of operations or financial condition, including, without limitation, increased expenses or changes in the demand for our services, or on the U.S.-domestic or global economies or financial markets. We

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expect that our business will remain subject to extensive regulation and supervision. Several other aspects of the regulatory environment in which we operate, and related risks, are discussed below. Additional information is provided under "Supervision and Regulation" in Business in this Form 10-K.

Resolution Planning

We are required to periodically submit a plan for rapid and orderly resolution in the event of material financial distress or failure commonly referred to as a resolution plan or a living will to the Federal Reserve and the FDIC under Section 165(d) of the Dodd-Frank Act. Through resolution planning, we seek, in the event of insolvency, to maintain State Street Bank's role as a key infrastructure provider within the financial system, while minimizing risk to the financial system and maximizing value for the benefit of our stakeholders. Significant management attention and resources are required in an effort to meet regulatory expectations with respect to resolution planning.

In the event of material financial distress or failure, our preferred resolution strategy is the SPOE Strategy. Our resolution plan, including our implementation of the SPOE strategy with a secured support agreement, involves important risks, including that: (1) the SPOE Strategy and the obligations under the support agreement may result in the recapitalization of State Street Bank and the commencement of bankruptcy proceedings by the Parent Company at an earlier stage of financial stress than might otherwise occur without such mechanisms in place; (2) an expected effect of the SPOE Strategy, together with applicable TLAC regulatory requirements, is that our losses will be imposed on Parent Company shareholders and the holders of long-term debt and other forms of TLAC securities currently outstanding or issued in the future by the Parent Company, as well as on any other Parent Company creditors, before any of its losses are imposed on the holders of the debt securities of State Street Bank or certain of the Parent Company's other operating subsidiaries or any of their depositors or creditors or before U.S. taxpayers are put at risk; (3) there can be no assurance that there would be sufficient recapitalization resources available to ensure that State Street Bank and our other material entities are adequately capitalized following the triggering of the requirements to provide capital and/or liquidity under the support agreement; and (4) there can be no assurance that credit rating agencies, in response to our resolution plan or the support agreement, will not downgrade, place on negative watch or change their outlook on our debt credit ratings, generally or on specific debt securities. Additional information about the SPOE Strategy, including related risks, is provided under "Resolution Planning" in Business in this Form 10-K.

Systemic Importance

Our qualification in the U.S. as a SIFI, and our designation by the FSB as a G-SIB, to which certain regulatory capital surcharges may apply, subjects us to incrementally higher capital and prudential requirements, increased scrutiny of our activities and potential further regulatory requirements or increased regulatory expectations than those applicable to some of the financial institutions with which we compete as a custodian or asset manager. This qualification and designation also has significantly increased, and may continue to increase, our expenses associated with regulatory compliance, including personnel and systems, as well as implementation and related costs to enhance our programs.

Global and Non-U.S. Regulatory Requirements

The breadth of our business activities, together with the scope of our global operations and varying business practices in relevant jurisdictions, increase the complexity and costs of meeting our regulatory compliance obligations, including in areas that are receiving significant regulatory scrutiny. We are, therefore, subject to related risks of non-compliance, including fines, penalties, lawsuits, regulatory sanctions, difficulties in obtaining governmental approvals, limitations on our business activities or reputational harm, any of which may be significant. For example, the global nature of our client base requires us to comply with complex laws and regulations of multiple jurisdictions relating to economic sanctions and money laundering. In addition, we are required to comply not only with the U.S. Foreign Corrupt Practices Act, but also with the applicable anti-corruption laws of other jurisdictions in which we operate. Further, our global operating model requires that we comply with outsourcing oversight requirements, including with respect to affiliated entities, and data security standards of multiple jurisdictions and enable our clients to comply with outsourcing and data security requirements imposed upon them. Regulatory scrutiny of compliance with these and other laws and regulations is increasing and may, in some respects, impede the implementation of our global operating model that is central to both delivery of client service requirements and cost efficiency. We

sometimes face inconsistent laws and regulations across the various jurisdictions in which we operate. The evolving regulatory landscape may interfere with our ability to conduct our operations, with our pursuit of a common global operating model or with our ability to compete effectively with other financial institutions operating in those jurisdictions or which may be subject to different regulatory requirements than apply to us. In particular, non-U.S. regulations and initiatives that may be inconsistent or conflict with current or proposed regulations in the U.S. could create increased compliance and other costs that would adversely affect our business, operations or profitability. Geopolitical events such as the U.K.'s planned exit from

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the European Union also have the potential to increase the complexity and cost of regulatory compliance. In addition to U.S. regulatory initiatives, we are further affected by non-U.S. regulatory initiatives, including, without limitation, the proposed Risk Reduction Package, the Investment Firm Review, the review of EMIR, the Shareholder Rights Directive, as well as regulatory initiatives finalized and/or implemented over the last few years such as the GDPR, UCITS V, Money Market Funds Regulation MiFID II and MiFIR. Recent, proposed or potential regulations in the U.S. and E.U. with respect to short-term wholesale funding, such as repurchase agreements or securities lending, or other “shadow banking” activities, could also adversely affect not only our own operations but also the operations of the clients to which we provide services. In addition, anti-competitive, governance and other concerns with passive investment strategies have become the focus of legislative and regulatory debate which could significantly impact both our asset management business and the clients that we service.

Consequences of Regulatory Environment and Compliance Risks

Domestic and international regulatory reform could limit our ability to pursue certain business opportunities, increase our regulatory capital requirements, alter the risk profile of certain of our core activities and impose additional costs on us, otherwise adversely affect our business, our consolidated results of operations or financial condition and have other negative consequences, including, without limitation, a reduction of our credit ratings. Different countries may respond to the market and economic environment in different and potentially conflicting manners, which could increase the cost of compliance for us.

The evolving regulatory environment, including changes to existing regulations and the introduction of new regulations, may also contribute to decisions we may make to suspend, reduce or withdraw from existing businesses, activities, markets or initiatives. In addition to potential lost revenue associated with any such suspensions, reductions or withdrawals, any such suspensions, reductions or withdrawals may result in significant restructuring or related costs or exposures.

If we do not comply with governmental regulations, we may be subject to fines, penalties, lawsuits, delays, or difficulties in obtaining regulatory approvals or restrictions on our business activities or harm to our reputation, which may significantly and adversely affect our business operations and, in turn, our consolidated results of operations. The willingness of regulatory authorities to impose meaningful sanctions, and the level of fines and penalties imposed in connection with regulatory violations, have increased substantially since the financial crisis. Regulatory agencies may, at times, limit our ability to disclose their findings, related actions or remedial measures. Similarly, many of our

clients are subject to significant regulatory requirements and retain our services in order for us to assist them in complying with those legal requirements. Changes in these regulations can significantly affect the services that we are asked to provide, as well as our costs.

Adverse publicity and damage to our reputation arising from the failure or perceived failure to comply with legal, regulatory or contractual requirements could affect our ability to attract and retain clients. If we cause clients to fail to comply with any regulatory requirements, we may be liable to them for losses and expenses that they incur. In recent years, regulatory oversight and enforcement have increased substantially, imposing additional costs and increasing the potential risks associated with our operations. If this regulatory trend continues, it could continue to adversely affect our operations and, in turn, our consolidated results of operations and financial condition.

For additional information, see the risk factor, “Our businesses may be adversely affected by government enforcement and litigation.”

We are subject to enhanced external oversight as a result of certain agreements entered into in connection with the resolution of prior regulatory or governmental matters.

In June 2015, we entered into a written agreement with the Federal Reserve and the Massachusetts Division of Banks relating to deficiencies identified in our compliance programs with the requirements of the Bank Secrecy Act, AML regulations and U.S. economic sanctions regulations promulgated by OFAC. As part of this agreement, we have been required to, among other things, implement improvements to our compliance programs.

Separately, in connection with the resolution of certain proceedings relating to our having charged six clients of our transition management business during 2010 and 2011 amounts in excess of the contractual terms, in January 2017, we entered into a deferred prosecution agreement with the Department of Justice and the United States Attorney for

the District of Massachusetts under which we agreed to retain an independent compliance and ethics monitor for a term of three years (subject to extension) to, among other things, review and monitor the effectiveness of our compliance controls and business ethics and make related recommendations, and in September 2017, we entered into a settlement agreement with the SEC that also requires us to retain an independent ethics and compliance consultant. We have retained a monitor who is fulfilling our obligations under both the deferred prosecution agreement and the SEC settlement. Responding to the monitor's requests entails significant cost and management attention and we are, in general, required to implement remediation plans to address any of the monitor's recommendations. These

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recommendations may require substantial cost and effort to remediate and, even when consistent with our own control enhancement objectives, may reflect differences in approach, timing and cost than we may independently intend. Under the deferred prosecution agreement we also have a heightened obligation promptly to report issues involving potential or alleged fraudulent activities to the DOJ.

As a result of the enhanced inspections and monitoring activities to which we are subject under these agreements, governmental authorities may identify areas in which we may need to take actions, which may be significant, to enhance our regulatory compliance or risk management practices. Such remedial actions may entail significant cost, management attention, and systems development and such efforts may affect our ability to expand our business until such remedial actions are completed. These actions may be in addition to remedial measures required by the Federal Reserve and other financial regulators following examinations as a result of increased prudential expectations regarding our compliance programs, culture and risk management. Our failure to implement enhanced compliance and risk management procedures in a manner and in a time frame deemed to be responsive by the applicable regulatory authority could adversely impact our relationship with such regulatory authority and could lead to restrictions on our activities or other sanctions. Moreover, the identification of new or additional facts and circumstances suggesting inappropriate or non-compliant conduct, whether identified by the monitor or a regulatory authority, in the course of an inspection, or independently by us could lead to new governmental proceedings or the re-opening of matters that were previously resolved. The presence of the monitor, as well as governmental programs rewarding whistleblowing, may also increase the instances of current or former employees alleging that certain practices are inconsistent with our legal or regulatory obligations.

Our businesses may be adversely affected by government enforcement and litigation.

The businesses in which we operate are highly-regulated and subject to extensive external scrutiny that may be directed generally to participants in the businesses or markets in which we are involved or may be specifically directed at us, including as a result of whistleblower and qui tam claims. In the course of our business, we are frequently subject to various regulatory, governmental and law enforcement inquiries, investigative demands and subpoenas, and from time to time, our clients, or the government on its own behalf or on behalf of our clients or others, make claims and take legal action relating to, among other things, our performance of our fiduciary, contractual or regulatory responsibilities. Often, the announcement of any such matters, or of any settlement of a claim or

action, whether it involves us or others in our industry, may spur the initiation of similar claims by other clients or governmental parties. Regulatory authorities have, and are likely to continue to, initiate cross industry reviews when a material issue is identified at a financial institution. Such inquiries involve costs and management time and may lead to proceedings relating to our own activities.

Regardless of the outcome of any governmental enforcement or litigation matter, responding to such matters is time-consuming and expensive and can divert the attention of senior management. Governmental enforcement and litigation matters can involve claims for disgorgement, demands for substantial monetary damages, the imposition of civil or criminal penalties, and the imposition of remedial sanctions or other required changes in our business practices, any of which could result in increased expenses, loss of client demand for our products or services, or harm to our reputation. The exposure associated with any proceedings that may be threatened, commenced or filed against us could have a material adverse effect on our consolidated results of operations for the period in which we establish a reserve with respect to such potential liability or upon our reputation. In government settlements since the financial crisis, the fines imposed by authorities have increased substantially and may exceed in some cases the profit earned or harm caused by the regulatory or other breach. For example, in connection with the resolution of the transition management matter, we agreed to pay a fine of £22.9 million (approximately \$37.8 million) to the U.K. FCA in 2014 and fines of \$32.3 million to each of the DOJ and the SEC in 2017. As a further example, we paid an aggregate of \$575 million in 2016 to resolve a series of investigations and governmental and private claims alleging that our indirect foreign exchange rates prior to 2008 were not adequately disclosed or were otherwise improper. These matters have also resulted in regulatory focus on the manner in which we charge clients and related disclosures. This focus may lead to increased and prolonged governmental inquiries and client, qui tam and whistleblower claims associated

with the amount and disclosure of compensation we receive for our products and services.

Moreover, U.S. and certain international governmental authorities have increasingly brought criminal actions against financial institutions, and criminal prosecutors have increasingly sought and obtained criminal guilty pleas, deferred prosecution agreements or other criminal sanctions from financial institutions. For example, in 2017 we entered into a deferred prosecution agreement with the U.S. Department of Justice in connection with the resolution of the transition management matter, and such agreement could increase the likelihood that governmental authorities will seek criminal sanctions

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against us in pending or future legal proceedings. See “We are subject to various legal proceedings relating to the manner in which we have invoiced certain expenses, and the outcome of such proceedings could materially adversely affect our results of operations or harm our business or reputation.” Government authorities may also pursue criminal claims against current or former employees, and these matters can, among other things, involve continuing reputational harm to us. For example, four of our former employees were indicted by U.S. prosecutors on charges of criminal conspiracy in connection with their involvement in the transition management matter. Two of these individuals pled guilty, and a third was convicted in 2018.

In many cases, we are required or may choose to report inappropriate or non-compliant conduct to the authorities, and our failure or delay to do so may represent an independent regulatory violation or be treated as an indication of non-cooperation with governmental authorities. Even when we promptly report a matter, we may nonetheless experience regulatory fines, liabilities to clients, harm to our reputation or other adverse effects. Moreover, our settlement or other resolution of any matter with any one or more regulators or other applicable party may not forestall other regulators or parties in the same or other jurisdictions from pursuing a claim or other action against us with respect to the same or a similar matter.

For more information about current contingencies relating to legal proceedings, see Note 13 to the consolidated financial statements in this Form 10-K. The resolution of certain pending or potential legal or regulatory matters could have a material adverse effect on our consolidated results of operations for the period in which the relevant matter is resolved or an accrual is determined to be required, on our consolidated financial condition or on our reputation. In view of the inherent difficulty of predicting the outcome of legal and regulatory matters, we cannot provide assurance as to the outcome of any pending or potential matter or, if determined adversely against us, the costs associated with any such matter, particularly where the claimant seeks very large or indeterminate damages or where the matter presents novel legal theories, involves a large number of parties, involves the discretion of governmental authorities in seeking sanctions or negotiated resolution or is at a preliminary stage. We may be unable to accurately estimate our exposure to the risks of legal and regulatory contingencies when we record reserves for probable and estimable loss contingencies. As a result, any reserves we establish may not be sufficient to cover our actual financial exposure. Similarly, our estimates of the aggregate range of reasonably possible loss for legal and regulatory contingencies are based upon then-available information and are subject to significant judgment and a variety of assumptions and known and unknown uncertainties. The matters underlying the

estimated range will change from time to time, and actual results may vary significantly from the estimate at any time.

We are subject to various legal proceedings relating to the manner in which we have invoiced certain expenses, and the outcome of such proceedings could materially adversely affect our results of operations, or harm our business or reputation.

In 2015, we determined we had incorrectly invoiced some of our Investment Servicing clients for certain expenses. We have reimbursed most of our affected customers for what we determined to be the overcharges and we have implemented enhancements to our billing processes. In connection with our enhancements to our billing processes, we continue to review historical billing practices and may from time to time identify additional required remediation. We identified, at the end of 2017, an additional area of past incorrect billing for certain mailing services expenses arising in our retirement services business. The accrual for loss contingencies at December 31, 2018 included an estimate of the amount we anticipate reimbursing clients due to that error. We currently expect the cumulative total of our payments to customers for these invoicing errors, including the error in the retirement services business, to be at least \$380 million, all of which has been paid or is accrued. However, we may identify additional remediation costs. See the risk factor “Our efforts to improve our billing processes and practices are ongoing and may result in the identification of additional billing errors.”

In 2017, a purported class action was commenced against us alleging that our invoicing practices violated duties owed to retirement plan customers under ERISA. In addition, we have received a purported class action demand letter alleging that our invoicing practices were unfair and deceptive under Massachusetts law. A class of customers, or particular customers, may assert that we have not paid to them all amounts incorrectly invoiced, and may seek double

or treble damages under Massachusetts law.

We are also cooperating with investigations by governmental and regulatory authorities on these matters, including the civil and criminal divisions of the DOJ, the SEC, the DOL and the Massachusetts Attorney General, which could result in significant fines or other sanctions, civil and criminal, against us. If these governmental or regulatory authorities were to conclude that all or a portion of the billing errors merited civil or criminal sanctions, any fine or other penalty could be a significant percentage, or a multiple of, the portion of the overcharging serving as the basis of such a claim or of the full amount overcharged. The governmental and regulatory authorities have significant discretion in civil and criminal matters as to the fines and other penalties they may seek to impose. The severity of such fines or other penalties could take into account factors

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such as the amount and duration of our incorrect invoicing, the government's or regulator's assessment of the conduct of our employees, as well as prior conduct such as that which resulted in our January 2017 deferred prosecution agreement in connection with transition management services and our settlement of civil claims regarding our indirect foreign exchange business. The staff of the SEC has informed us that it intends to ask the SEC for permission to bring an action against us asserting that we overcharged clients that are registered investment companies for custody expenses in violation of §§ 31(a), 34(b) and 37 of the Investment Company Act of 1940, and Rules 31a-1(a) and 31a-1(b) thereunder. We have submitted to the staff of the SEC a response, which included a settlement proposal that the staff has indicated is too low, and we remain in discussions with the staff as to a possible settlement. Our aggregate accruals for loss contingencies for legal and regulatory matters as of December 31, 2018 include the amount of penalties reflected in our most recent settlement proposal. There can be no assurance that any settlement, whether with the SEC or other governmental authorities, will be reached or, if so, the amount of the settlement or its impact on other claims relating to these matters. In the first half of 2019, it is likely that discussions will commence with the DOJ regarding a potential resolution of their investigation regarding this matter, which will then enable us to better assess the potential penalties and/or sanctions they will be seeking. The aggregate amount of penalties that may potentially be imposed upon us in connection with the resolution of all outstanding investigations into our historical billing practices could be multiples of the potential penalties being discussed with the staff of the SEC.

The outcome of any of these proceedings and, in particular, any criminal sanction could materially adversely affect our results of operations and could have significant collateral consequences for our business and reputation. Our efforts to improve our billing processes and practices are ongoing and may result in the identification of additional billing errors.

In 2015, we determined we had incorrectly invoiced some of our Investment Servicing clients for certain expenses. In 2016, we began the process of remediating these errors, improving our billing processes and controls in the asset servicing business and other businesses, and testing these improved billing processes and controls. As a result of such review, we may modify, enhance, and, where necessary, replace our existing global billing processes and implement and test controls for the new system. The objectives of this billing transformation process are to obtain greater billing accuracy and consistency across business lines. Our goal is for this billing transformation process to be completed over the next three or more years, but there can be no assurance as

to when we will complete this process or that it will allow us to meet the objectives we have set for it. Because of the scale of our business, implementing enhanced billing controls will be expensive and time consuming, may not succeed in identifying and remediating all weaknesses and inefficiencies in our billing processes and cannot be implemented in all our business units concurrently. Accordingly, the costs of the billing transformation process, and the costs to remediate billing errors which may be discovered in that process, would likely be incurred over a period that we are now unable accurately to determine. As we work through this process, we have discovered and may continue to discover areas where we believe our billing processes need improvement, where we believe we have made billing errors with respect to particular customers and categories of fees and expenses, and where we believe billing arrangements between ourselves and particular customers should be clarified. For example, we identified at the end of 2017 an additional area of past incorrect billing for certain mailing services expenses in our retiree services business and will be reimbursing the amounts associated with this issue to affected clients. Such discoveries may lead to increased expense and decreased revenues, the need to remediate prior billing errors, government investigations, or litigation that may materially impact our business, financial results and reputation.

Any failures of or damage to, attack on or unauthorized access to our information technology systems or facilities or disruptions to our continuous operations, including the systems, facilities or operations of third parties with which we do business, such as resulting from cyber-attacks, could result in significant limits on our ability to conduct our business activities, costs and reputational damage.

Our businesses depend on information technology infrastructure, both internal and external, to, among other things, record and process a large volume of increasingly complex transactions and other data, in many currencies, on a daily basis, across numerous and diverse markets and jurisdictions. In recent years, several financial services firms have suffered successful cyber-attacks launched both domestically and from abroad, resulting in the disruption of services

to clients, loss or misappropriation of sensitive or private data and reputational harm. We also have been subjected to cyber-attacks, and although we have not to our knowledge suffered a material breach or suspension of our systems, it is possible that we could suffer such a breach or suspension in the future. Cyber-threats are sophisticated and continually evolving. We may not implement effective systems and other measures to effectively prevent or mitigate the full diversity of cyber-threats or improve and adapt such systems and measures as such threats evolve and advance.

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Our computer, communications, data processing, networks, backup, business continuity, disaster recovery or other operating, information or technology systems, facilities and activities may suffer disruptions or otherwise fail to operate properly or become disabled, overloaded or damaged as a result of a number of factors, including, without limitation, events that are wholly or partially beyond our control, which could adversely affect our ability to process transactions, provide services or maintain systems availability, maintain compliance and internal controls or otherwise appropriately conduct our business activities. For example, there could be sudden increases in transaction or data volumes, electrical or telecommunications outages, natural disasters, cyber-attacks or employee or contractor error or malfeasance. We may not successfully prevent, respond to, recover from or learn from any such disruptions or failures.

The third parties with which we do business, which facilitate our business activities, to whom we outsource operations or other activities, from whom we receive products or services or with whom we otherwise engage or interact, including, without limitation, financial intermediaries and technology infrastructure and service providers, are also susceptible to the foregoing risks (including the third parties with which they are similarly interconnected or on which they otherwise rely), and our or their business operations and activities may therefore be adversely affected, perhaps materially, by failures, terminations, errors or malfeasance by, or attacks or constraints on, one or more financial, technology, infrastructure or government institutions or intermediaries with whom we or they are interconnected or conduct business.

In particular, we, like other financial services firms, will continue to face increasing cyber threats, including, without limitation, computer viruses, malicious code, distributed denial of service attacks, phishing attacks, ransomware, information security breaches or employee or contractor error or malfeasance that could result in the unauthorized release, gathering, monitoring, misuse, loss or destruction of our, our clients' or other parties' confidential, personal, proprietary or other information or otherwise disrupt, compromise or damage our or our clients' or other parties' business assets, operations and activities. Our status as a global SIFI likely increases the risk that we are targeted by such cyber- security threats. In addition, some of our service offerings, such as data warehousing, may also increase the risk we are, and the consequences of being, so targeted. We therefore could experience significant related costs and exposures, including, without limitation, lost or constrained ability to provide our services or maintain systems availability to clients, regulatory inquiries, enforcements, actions and fines, litigation, damage to our reputation or property and enhanced competition.

Due to our dependence on technology and the important role it plays in our business operations, we must persist in improving and updating our information technology infrastructure, among other things, (1) as some of our systems are approaching the end of their useful life, are redundant or do not share data without reconciliation; (2) to be more efficient, meet client expectations and support opportunities of growth; and (3) to enhance resiliency and maintain business continuity. Updating these systems involves material costs and often involves implementation, integration and security risks, including, without limitation, risks that we may not adequately anticipate the market or technological trends or client needs or experience unexpected challenges that could cause financial, reputational and operational harm. However, failing to properly respond to and invest in changes and advancements in technology can limit our ability to attract and retain clients, prevent us from offering similar products and services as those offered by our competitors, impair our ability to maintain continuous operations and inhibit our ability to meet regulatory requirements.

Any theft, loss or other misappropriation or inadvertent disclosure of, or inappropriate access to, the confidential information we possess could have an adverse impact on our business and could subject us to regulatory actions, litigation and other adverse effects.

Our businesses and relationships with clients are dependent on our ability to maintain the confidentiality of our and our clients' trade secrets and confidential information (including, without limitation, client transactional and holdings data and personal data about our employees, our clients and our clients' clients). Unauthorized access, or failure of our controls with respect to granting access to our systems, may occur, potentially resulting in theft, loss, or other misappropriation of such information. In addition, our or our vendors' personnel have in the past and may in the future inadvertently disclose client or other confidential information. Any theft, loss, other misappropriation or inadvertent

disclosure of confidential information could have a material adverse impact on our competitive position, our relationships with our clients and our reputation and could subject us to regulatory inquiries, enforcement and fines, civil litigation and possible financial liability or costs. To the extent any of these events involve personally sensitive information, the risks of enhanced regulatory scrutiny and the potential financial liabilities are exacerbated, particularly under data protection regulations such as the GDPR.

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We are subject to variability in our assets under custody and/or administration and assets under management, and in our financial results, due to the significant size of many of our institutional clients, and are also subject to significant pricing pressure due to the considerable market influence exerted by those clients.

Our clients include institutional investors, such as mutual funds, collective investment funds, UCITS, hedge funds and other investment pools, corporate and public retirement plans, insurance companies, foundations, endowments and investment managers. In both our asset servicing and asset management businesses, we endeavor to attract institutional investors controlling large and diverse pools of assets, as those clients typically have the opportunity to benefit from the full range of our expertise and service offerings. Due to the large pools of assets controlled by these clients, the loss or gain of one client, or even a portion of the assets controlled by one client, could have a significant effect on our AUC/A or our AUM, as applicable, in the relevant period. Loss of all or a portion of the servicing of a client's assets can occur for a variety of reasons. For example, as previously reported, as a result of a decision to diversify providers, in 2018 one of our large clients moved the servicing for a portion of its assets, largely common trust funds, to another provider. The transition represented approximately \$1 trillion in assets with respect to which we will no longer derive revenue. Our AUM or AUC/A are also affected by decisions by institutional owners to favor or disfavor certain investment instruments or categories. Similarly, if one or more clients change the asset class in which a significant portion of assets are invested (e.g., by shifting investments from emerging markets to the U.S.), those changes could have a significant effect on our results of operations in the relevant period, as our fee rates often change based on the type of asset classes we are servicing or managing. In 2018, several industry-wide and company specific trends continued to impact AUC/A and AUM asset levels. As our fee revenue is significantly impacted by our levels of AUC/A and AUM, changes in levels of different asset classes could have a corresponding significant effect on our results of operations in the relevant period. Large institutional clients also, by their nature, are often able to exert considerable market influence, and this, combined with strong competitive forces in the markets for our services, has resulted in, and may continue to result in, significant pressure to reduce the fees we charge for our services in both our asset servicing and asset management lines of business. Our strategy of focusing our efforts on the segments of the market for investor services represented by very large asset managers and asset owners causes us to be particularly impacted by this industry trend. Many of these large clients are also under competitive and regulatory pressures that are driving them to manage the

expenses that they and their investment products incur more aggressively, which in turn exacerbates their pressures on our fees.

Our business may be negatively affected by adverse business decisions or our failure to properly implement or execute strategic programs and priorities.

In order to maintain and grow our business, we must make strategic decisions about our current and future business plans and effectively execute upon those plans. Strategic initiatives that we are currently developing or executing against include cost initiatives, enhancements and efficiencies to our operational processes, improvements to existing and new service offerings, targeting for sales growth certain segments of the markets for investor services and asset management, and enhancements to existing and development of new information technology and other systems. Implementing strategic programs and creating cost efficiencies involves certain strategic, technological and operational risks.

Strategic Risk

In late 2015, we announced Beacon, a multi-year program to create cost efficiencies through changes in our operational processes and to further digitize our processes and interfaces with our clients. In 2019, we announced that, having completed our Beacon program, we were launching an additional effort to reduce expenses through resource discipline, automation and process re-engineering. We may undertake additional strategic initiatives on cost management, operating effectiveness or other matters of varying sizes, some of which may be material. Operational process and information technology transformations, such as Beacon and the recently announced expense initiative, as well as future strategic initiatives we may undertake, entail significant risks. The new program, and any future strategic initiatives we implement, may prove to be inadequate to achieve its objectives, may not achieve the anticipated automation or process re-engineering, may not be successfully implemented or meet client expectations

and may not be responsive to industry, technological or market changes. These programs also may result in increased or unanticipated costs, may result in earnings volatility, may take longer than anticipated to implement and may result in increases in operating losses, inadvertent data disclosures or other operating errors. In implementing these programs, we may have material dependencies on third parties. In addition, our efforts to manage expenses may be matched or exceeded by our competitors. Any failure to implement any strategic initiative on cost management, operational effectiveness or other matters we may undertake, in whole or in part may, among other things, reduce our competitive position, diminish the cost effectiveness of our systems and processes or provide an insufficient

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return on our associated investment. The success of expense management programs and our other strategic plans could also be affected by market disruptions and unanticipated changes in the overall market for financial services and the global economy. We also may not be able to abandon or alter these plans without significant loss, as the implementation of our decisions may involve significant capital outlays, often far in advance of when we expect to generate any anticipated revenues, realize expected cost savings or achieve desired operational efficiencies.

Accordingly, our business, our consolidated results of operations and our consolidated financial condition may be adversely affected by any failure or delay in our strategic decisions, including the program or elements thereof. For additional information about the program, see "Expenses" in "Consolidated Results of Operations" included in our Management's Discussion and Analysis in this Form 10-K.

Information Technology Obsolescence and Operational Transformation

Many features of our initiatives include investment in systems integration and new technologies and also the development of new, and the evolution of existing, methods and tools to accelerate the pace of innovation, the introduction of new services and enhancements to the security of our data systems. The transition to new operating processes and technology infrastructure may cause disruptions in our relationships with clients and employees or loss of institutional understanding and may present other unanticipated technical or operational hurdles. In addition, the relocation to or expansion of servicing activities and other operations in different geographic regions or vendors may entail client, regulatory and other third party data use, storage and security challenges, as well as other regulatory compliance, business continuity and other considerations. As a result, we may not achieve some or all of the cost savings or other benefits anticipated and may experience unanticipated challenges from clients, regulators or other parties or reputational harm. In addition, some systems development initiatives may not have access to significant resources or management attention and, consequently, may be delayed or unsuccessful. Many of our systems require enhancements to meet the requirements of evolving regulation, to enhance resiliency and decommission obsolete technologies, to permit us to optimize our use of capital or to reduce the risk of operating error. In addition, the implementation of our front to back office platform and integration of Charles River Development will require substantial systems development and expense. We may not have the resources to pursue all of these objectives simultaneously.

Development and completion of new products and services, including without limitation, our interoperable front-to-back servicing platform, may impose additional costs on us, involve dependencies on third parties and may expose us to increased operational and model risk.

Our financial performance depends, in part, on our ability to develop and market new and innovative services and to adopt or develop new technologies that differentiate our products or provide cost efficiencies, while avoiding increased related expenses. This dependency is exacerbated in the current "FinTech" environment, where financial institutions are investing significantly in evaluating new technologies, such as distributed ledger technology ("Blockchain"), and developing potentially industry-changing new products, services and industry standards. For example, in 2018, we acquired Charles River Development, and we are leveraging the capabilities we acquired in that transaction to create an interoperable front-to-back office servicing platform combining the offerings within our Investment Servicing business line. The introduction of new products and services can require significant time and resources, including regulatory approvals and the development and implementation of technical, control and model validation requirements. New products and services, such as an interoperable front-to-back office servicing platform, often also involve dependencies on third parties to, among other things, access innovative technologies, develop new distribution channels or form collaborative product and service offerings, and can require complex strategic alliances and joint venture relationships. Substantial risks and uncertainties are associated with the introduction of new products and services, strategic alliances and joint ventures including rapid technological change in the industry, our ability to access technical and other information from our clients, the significant and ongoing investments required to bring new products and services to market in a timely manner at competitive prices, the sharing of benefits in those relationships, conflicts with existing business partners and clients and sales and other materials that fully and accurately describe the product or service and its underlying risks and are compliant with applicable regulations. Our failure to manage these risks and uncertainties also exposes us to enhanced risk of operational lapses which may result in the recognition of

financial statement liabilities. Regulatory and internal control requirements, capital requirements, competitive alternatives, vendor relationships and shifting market preferences may also determine if such initiatives can be brought to market in a manner that is timely and attractive to our clients. Failure to successfully manage all of the above risks in the development and implementation of new products or services, including, without limitation, completion of our interoperable front-to-back office servicing platform, could have a material

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adverse effect on our business and reputation, consolidated results of operations or financial condition.

Acquisitions, strategic alliances, joint ventures and divestitures pose risks for our business.

As part of our business strategy, we acquire complementary businesses and technologies, enter into strategic alliances and joint ventures and divest portions of our business. We undertake transactions of varying sizes to, among other reasons, expand our geographic footprint, access new clients, technologies or services, develop closer or more collaborative relationships with our business partners, bolster existing servicing capabilities, efficiently deploy capital or leverage cost savings or other business or financial opportunities. We may not achieve the expected benefits of these transactions, which could result in increased costs, lowered revenues, ineffective deployment of capital, regulatory concerns, exit costs or diminished competitive position or reputation.

Transactions of this nature also involve a number of risks and financial, accounting, tax, regulatory, strategic, managerial, operational, cultural and employment challenges, which could adversely affect our consolidated results of operations and financial condition. For example, the businesses that we acquire or our strategic alliances or joint ventures may under-perform relative to the price paid or the resources committed by us; we may not achieve anticipated revenue growth or cost savings; or we may otherwise be adversely affected by acquisition-related charges. The intellectual property of an acquired business may be an important component of the value that we agree to pay for such a business. However, such acquisitions are subject to the risks that the acquired business may not own the intellectual property that we believe we are acquiring, that the intellectual property is dependent on licenses from third parties, that the acquired business infringes on the intellectual property rights of others, that the technology does not have the acceptance in the marketplace that we anticipated or that the technology requires significant investment to remain competitive. Further, past acquisitions have resulted in the recognition of goodwill and other significant intangible assets in our consolidated statement of condition. For example, we recorded goodwill and intangible assets of approximately \$2.46 billion associated with our acquisition of Charles River Development in 2018. These assets are not eligible for inclusion in regulatory capital under applicable requirements. In addition, we may be required to record impairment in our consolidated statement of income in future periods if we determine that the value of these assets has declined.

Through our acquisitions or joint ventures, we may also assume unknown or undisclosed business, operational, tax, regulatory and other liabilities, fail to properly assess known contingent liabilities or assume

businesses with internal control deficiencies. While in most of our transactions we seek to mitigate these risks through, among other things, due diligence, indemnification provisions or insurance, these or other risk-mitigating provisions we put in place may not be sufficient to address these liabilities and contingencies and involve credit and execution risks associated with successfully seeking recourse from a third party, such as the seller or an insurance provider. Other major financial services firms have recently paid significant penalties to resolve government investigations into matters conducted in significant part by acquired entities.

Various regulatory approvals or consents, formal or informal, are generally required prior to closing of these transactions, which may include approvals or non-objections from the Federal Reserve and other domestic and non-U.S. regulatory authorities. These regulatory authorities may impose conditions on the completion of the acquisition or require changes to its terms that materially affect the terms of the transaction or our ability to capture some of the opportunities presented by the transaction, or may not approve the transaction. Any such conditions, or any associated regulatory delays, could limit the benefits of the transaction. Acquisitions or joint ventures we announce may not be completed if we do not receive the required regulatory approvals, if regulatory approvals are significantly delayed or if other closing conditions are not satisfied.

The integration and the retention and development of the benefits of our acquisitions results in risks to our business and other uncertainties.

In recent years, we have undertaken several acquisitions, including our 2018 acquisition of Charles River Development and our 2016 acquisition of the GEAM business. The integration of acquisitions presents risks that differ from the risks associated with our ongoing operations. Integration activities are complicated and time consuming and can involve significant unforeseen costs. We may not be able to effectively assimilate services, technologies, key personnel or businesses of acquired companies into our business or service offerings as anticipated,

and we may not achieve related revenue growth or cost savings. We also face the risk of being unable to retain, or cross-sell our products or services to, the clients of acquired companies or joint ventures and the risk of being unable to cross-sell acquired products or services to our existing clients. In particular, some clients, including significant clients, of an acquired business may have the right to transition their business to other providers on short notice for convenience, fiduciary or other reasons and may take the opportunity of the acquisition or market, commercial, relationship, service satisfaction or other developments following the acquisition to terminate, reduce or renegotiate the fees or other terms of our relationship. Any such client

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losses, reductions or renegotiations likely will reduce the expected benefits of the acquisition, including, without limitation, revenues, cross-selling opportunities and market share or cause impairment to goodwill and other intangibles, which effects could be material, and we may not have recourse against the seller of the business or the client. The risk of client loss is even greater where the client is a competitor of ours. Acquisitions of technology firms can involve extensive information technology integration, with associated risk of defects, and product enhancement and development activities, the costs of which can be difficult to estimate, as well as heightened cultural and compliance concerns in integrating an unregulated firm into a bank regulatory environment. Acquisitions of Investment Servicing businesses entail information technology systems conversions, which involve operational risks. With any acquisition, the integration of the operations and resources of the businesses could result in the loss of key employees, the disruption of our and the acquired company's ongoing businesses or inconsistencies in standards, controls, procedures or policies that could adversely affect our ability to maintain relationships with clients or employees, maintain regulatory compliance or to achieve the anticipated benefits of the acquisition. Integration efforts may also divert management attention and resources.

Our acquisition of Charles River Development and the integration of its business, operations and employees with our own may be more difficult, costly or time consuming than expected, and the anticipated benefits and cost synergies of the acquisition may not be fully realized, which could adversely impact our business operations, financial condition and results of operations.

We completed our acquisition of Charles River Development on October 1, 2018. The success of the acquisition, including the achievement of anticipated growth opportunities and cost synergies of the acquisition, is subject to a number of uncertainties and will depend, in part, on our ability to successfully combine and integrate Charles River Development's business into our business in an efficient and effective manner. The combined company may face significant challenges in implementing such integration, including without limitation, challenges related to: integrating Charles River Development's business into our own in a manner that permits the combined company to achieve the cost and operating synergies anticipated to result from the acquisition, which could result in the anticipated benefits of the acquisition not being realized partly or wholly in the time frame currently anticipated or at all;

- retaining Charles River Development's clients, some of which are our competitors;

- retaining key management and technical personnel;

- integrating Charles River Development's software solutions with our existing products and services and related operations and systems, including performance, risk and compliance analytics, investment manager operations outsourcing, accounting, administration and custody;

- accelerating the development of enhancements to the features and functions of Charles River Development's software solutions;

- coordinating and integrating our internal operations, compensation programs, policies and procedures, and corporate structures;

- potential unknown liabilities and unforeseen or increased costs and expenses;

- the possibility of faulty assumptions underlying expectations regarding potential synergies and the integration process;

- incurring significant acquisition-related costs and expenses associated with combining our operations; and

- performance shortfalls as a result of the diversion of management's attention and resources caused by integrating the companies' operations.

Any of these factors could result in our failure to realize the anticipated benefits of the acquisition, on the expected timeline or at all, and could adversely impact our business operations, financial condition and results of operations. Cost shifting to non-U.S. jurisdictions and outsourcing may expose us to increased operational risk and reputational harm and may not result in expected cost savings.

We manage expenses by migrating certain business processes and business support functions to lower-cost geographic locations, such as India, Poland and China, and by outsourcing to vendors in various jurisdictions and to joint ventures. This effort exposes us to the risk that we may not maintain service quality, control and effective

management or business resiliency within these operations during and after transitions. These migrations also involve risks that our outsourcing vendors or joint ventures may not comply with their servicing and other contractual obligations to us, including, without limitation, with respect to indemnification and information security, and to the risk that we may not satisfy applicable regulatory responsibilities regarding the management and oversight of third parties and outsourcing providers. Our geographic footprint also exposes us to the relevant macroeconomic, political, legal and similar risks generally involved in doing business in the jurisdictions

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in which we establish lower-cost locations or joint ventures or in which our outsourcing vendors locate their operations. The increased elements of risk that arise from certain operating processes being conducted in some jurisdictions could lead to an increase in reputational risk. During periods of transition of operations, greater operational risk and client concerns exist with respect to maintaining a high level of service delivery and business resiliency. The extent and pace at which we are able to move functions to lower-cost locations, joint ventures and outsourcing providers may also be affected by political, regulatory and client acceptance issues, including with respect to data use, storage and security. Such relocation or outsourcing of functions also entails costs, such as technology, real estate and restructuring expenses, which may offset or exceed the expected financial benefits of the relocation or outsourcing. In addition, the financial benefits of lower-cost locations and of outsourcings may diminish over time or could be offset in the event that the U.S. or other jurisdictions impose tax, trade barrier or other measures which seek to discourage the use of lower cost jurisdictions.

The market transition away from broad use of the London Interbank Offered Rate (LIBOR) as an interest rate benchmark may impose additional costs on us and may expose us to increased operational, model and financial risk. Globally, regulators have advised large banks to assess the risks and to prepare for transition from LIBOR to alternative rates ahead of year end 2021. Our financial performance depends, in part, on our ability to adapt to market changes promptly, while avoiding increased related expenses or operational errors. Substantial risks and uncertainties are associated with the market transition away from the use of LIBOR as a critical interest rate benchmark used to determine amounts payable, under and the value of, financial instruments and contracts.

Due to our dependencies on LIBOR, the failure or inability to timely plan and implement a LIBOR transition program to maintain operational continuity and minimize economic impact for our clients, ourselves and other stakeholders could negatively impact our business and financial performance. Those dependencies include, without limitation, LIBOR-based securities and loans held in our investment portfolio, LIBOR-based preferred stock and long-term debt issued by us and LIBOR-based client fee schedules and deposit pricing. Also, our internal models which support decision making and risk management will require adjustments, which may cause weaknesses in the underlying model, inadequate assumptions or lead to reliance on poor or inaccurate data. Assets held by our customers in their investment portfolios or in the investment portfolios we manage for others have LIBOR-based terms. We need to enhance our processes and systems to account for the new

alternative rates-based instruments as they come to market, the transition of LIBOR-based instruments to their fallback language and uncertainty as to how such instruments should be valued where such fallback language is unclear. These process and systems requirements could adversely impact our business, which in some instances is dependent on critical inputs from third parties, who themselves must timely adapt to the market changes and failure to implement the terms of those instruments in a manner consistent with customer expectation could lead to disputes and operational issues. Failure or perceived failure to adequately prepare for LIBOR transition could affect our ability to attract and retain clients. Uncertainty relative to external developments necessary for the market transition away from LIBOR but outside of our control could further increase the costs and risks of the transition for us or our subsidiaries and have an adverse impact on our operational and financial performance.

Our calculations of credit, market and operational risk exposures, total RWA and capital ratios for regulatory purposes depend on data inputs, formulae, models, correlations and assumptions that are subject to change over time, which changes, in addition to our consolidated financial results, could materially impact our risk exposures, our total RWA and our capital ratios from period to period.

To calculate our credit, market and operational risk exposures, our total RWA and our capital ratios for regulatory purposes, the Basel III final rule involves the use of current and historical data, including our own loss data and similar information from other industry participants, market volatility measures, interest rates and spreads, asset valuations, credit exposures and the creditworthiness of our counterparties. These calculations also involve the use of quantitative formulae, statistical models, historical correlations and significant assumptions. We refer to the data, formulae, models, correlations and assumptions, as well as our related internal processes, as our “advanced systems.” While our advanced systems are generally quantitative in nature, significant components involve the exercise of judgment based on, among other factors, our and the financial services industry’s evolving experience. Any of these

judgments or other elements of our advanced systems may not, individually or collectively, precisely represent or calculate the scenarios, circumstances, outputs or other results for which they are designed or intended. Collectively, they represent only our estimate of associated risk.

In addition, our advanced systems are subject to update and periodic revalidation in response to changes in our business activities and our historical experiences, forces and events experienced by the market broadly or by individual financial institutions, changes in regulations and regulatory interpretations and other factors, and are also subject to continuing regulatory

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review and approval. For example, a significant operational loss experienced by another financial institution, even if we do not experience a related loss, could result in a material change in the output of our advanced systems and a corresponding material change in our risk exposures, our total RWA and our capital ratios compared to prior periods. An operational loss that we experience could also result in a material change in our capital requirements for operational risk under the advanced approaches, depending on the severity of the loss event, its characterization among the seven Basel-defined UOM, and the stability of the distributional approach for a particular UOM, and without direct correlation to the effects of the loss event, or the timing of such effects, on our results of operations. Due to the influence of changes in our advanced systems, whether resulting from changes in data inputs, regulation or regulatory supervision or interpretation, specific to us or more general market, or individual financial institution-specific, activities or experiences, or other updates or factors, we expect that our advanced systems and our credit, market and operational risk exposures, our total RWA and our capital ratios calculated under the Basel III final rule will change, and may be volatile, over time, and that those latter changes or volatility could be material as calculated and measured from period to period.

Our businesses may be negatively affected by adverse publicity or other reputational harm.

Our relationship with many of our clients is predicated on our reputation as a fiduciary and a service provider that adheres to the highest standards of ethics, service quality and regulatory compliance. Adverse publicity, regulatory actions or fines, litigation, operational failures or the failure to meet client expectations or fiduciary or other obligations could materially and adversely affect our reputation, our ability to attract and retain clients or key employees or our sources of funding for the same or other businesses. For example, over the past several years we have experienced adverse publicity with respect to our indirect foreign exchange trading, and this adverse publicity has contributed to a shift of client volume to other foreign exchange execution methods. Similarly, governmental actions and reputational issues in our transition management business in the U.K. have adversely affected our revenue from that business and, with criminal convictions or guilty pleas of three of our former employees in 2018 and the deferred prosecution agreement we entered into with the DOJ in early 2017 and the related SEC settlement, these effects have the potential to continue. The client invoicing matter we announced in late 2015 has the potential to result in similar effects. For additional information about these matters, see the risk factor "Our businesses may be adversely affected by government enforcement and litigation."

Preserving and enhancing our reputation also

depends on maintaining systems, procedures and controls that address known risks and regulatory requirements, as well as our ability to timely identify, understand and mitigate additional risks that arise due to changes in our businesses and the marketplaces in which we operate, the regulatory environment and client expectations.

We may not be able to protect our intellectual property, and we are subject to claims of third-party intellectual property rights.

Our potential inability to protect our intellectual property and proprietary technology effectively may allow competitors to duplicate our technology and products and may adversely affect our ability to compete with them. To the extent that we do not protect our intellectual property effectively through patents, maintaining trade secrets or other means, other parties, including, without limitation, former employees, with knowledge of our intellectual property may seek to exploit our intellectual property for their own or others' advantage. In addition, we may infringe on claims of third-party patents, and we may face intellectual property challenges from other parties, including without limitation, clients or service providers with whom we may engage in the development or implementation of other products, , services or solutions or to whose information we may have access for limited permitted purposes but with whom we also compete. The risk of such infringement is enhanced in the current competitive "Fintech" environment, particularly with respect to our development of new products and services containing significant technology elements and dependencies, any of which could become the subject of an infringement claim. We may not be successful in defending against any such challenges or in obtaining licenses to avoid or resolve any intellectual property disputes. Third-party intellectual rights, valid or not, may also impede our deployment of the full scope of our products and service capabilities in all jurisdictions in which we operate or market our products and services.

Our controls and procedures may fail or be circumvented, our risk management policies and procedures may be inadequate, and operational risks could adversely affect our consolidated results of operations.

We may fail to identify and manage risks related to a variety of aspects of our business, including, but not limited to, operational risk, interest rate risk, foreign exchange risk, trading risk, fiduciary risk, legal and compliance risk, liquidity risk and credit risk. We have adopted various controls, procedures, policies and systems to monitor and manage risk. While we currently believe that our risk management process is effective, we cannot provide assurance that those controls, procedures, policies and systems will always be adequate to identify and manage internal and external

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risks, including, without limitation, risks related to service providers, in our various businesses. The risk of individuals, either employees or contractors, engaging in conduct harmful or misleading to clients or to us, such as consciously circumventing established control mechanisms to exceed trading or investment management limitations, committing fraud or improperly selling products or services to clients, is particularly challenging to manage through a control framework. The financial and reputational impact of control or conduct failures can be significant. Persistent or repeated issues with respect to controls or individual conduct may raise concerns among regulators regarding our culture, governance and control environment. While we seek to contractually limit our financial exposure to operational risk, the degree of protection that we are able to achieve varies, and our potential exposure may be greater than the revenue we anticipate that we will earn from servicing our clients.

In addition, our businesses and the markets in which we operate are continuously evolving. We may fail to identify or fully understand the implications of changes in our businesses or the financial markets and fail to adequately or timely enhance our risk framework to address those changes. If our risk framework is ineffective, either because it fails to keep pace with changes in the financial markets, regulatory or industry requirements, our businesses, our counterparties, clients or service providers or for other reasons, we could incur losses, suffer reputational damage or find ourselves out of compliance with applicable regulatory or contractual mandates or expectations.

Operational risk is inherent in all of our business activities. As a leading provider of services to institutional investors, we provide a broad array of services, including, without limitation, research, investment management, trading services and investment servicing that expose us to operational risk. In addition, these services generate a broad array of complex and specialized servicing, confidentiality and fiduciary requirements, many of which involve the opportunity for human, systems or process errors. We face the risk that the control policies, procedures and systems we have established to comply with our operational requirements will fail, will be inadequate or will become outdated. We also face the potential for loss resulting from inadequate or failed internal processes, employee supervision or monitoring mechanisms, service-provider processes or other systems or controls, which could materially affect our future consolidated results of operations. Given the volume and magnitude of transactions we process on a daily basis, operational losses represent a potentially significant financial risk for our business. Operational errors that result in us remitting funds to a failing or bankrupt entity may be irreversible, and may subject us to losses.

We may also be subject to disruptions from

external events that are wholly or partially beyond our control, which could cause delays or disruptions to operational functions, including, without limitation, information processing and financial market settlement functions. In addition, our clients, vendors and counterparties could suffer from such events. Should these events affect us, or the clients, vendors or counterparties with which we conduct business, our consolidated results of operations could be negatively affected. When we record balance sheet accruals for probable and estimable loss contingencies related to operational losses, we may be unable to accurately estimate our potential exposure, and any accruals we establish to cover operational losses may not be sufficient to cover our actual financial exposure, which could have a material adverse effect on our consolidated results of operations.

The quantitative models we use to manage our business may contain errors that result in inadequate risk assessments, inaccurate valuations or poor business decisions, and lapses in disclosure controls and procedures or internal control over financial reporting could occur, any of which could result in material harm.

We use quantitative models to help manage many different aspects of our businesses. As an input to our overall assessment of capital adequacy, we use models to measure the amount of credit risk, market risk, operational risk, interest rate risk and liquidity risk we face. During the preparation of our consolidated financial statements, we sometimes use models to measure the value of asset and liability positions for which reliable market prices are not available. We also use models to support many different types of business decisions including, without limitation, trading activities, hedging, asset-and-liability management and whether to change business strategy. Weaknesses in the underlying model, inadequate model assumptions, normal model limitations, inappropriate model use, weaknesses in model implementation or poor data quality, could result in unanticipated and adverse consequences, including, without limitation, material loss and material non-compliance with regulatory requirements or expectations. Because of our widespread usage of models, potential weaknesses in our model risk management practices pose an ongoing

risk to us.

We also may fail to accurately quantify the magnitude of the risks we face. Our measurement methodologies rely on many assumptions and historical analyses and correlations. These assumptions may be incorrect, and the historical correlations on which we rely may not continue to be relevant. Consequently, the measurements that we make for regulatory purposes may not adequately capture or express the true risk profiles of our businesses. Moreover, as businesses and markets evolve, our measurements may not accurately reflect this evolution. While our risk

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measures may indicate sufficient capitalization, they may underestimate the level of capital necessary to conduct our businesses.

Additionally, our disclosure controls and procedures may not be effective in every circumstance, and, similarly, it is possible we may identify a material weakness or significant deficiency in internal control over financial reporting.

Any such lapses or deficiencies may materially and adversely affect our business and consolidated results of operations or consolidated financial condition, restrict our ability to access the capital markets, require us to expend significant resources to correct the lapses or deficiencies, expose us to regulatory or legal proceedings, subject us to fines, penalties or judgments or harm our reputation.

We may incur losses arising from our investments in sponsored investment funds, which could be material to our consolidated results of operations in the periods incurred.

In the normal course of business, we manage various types of sponsored investment funds through State Street Global Advisors. The services we provide to these sponsored investment funds generate management fee revenue, as well as servicing fees from our other businesses. From time to time, we may invest in the funds, which we refer to as seed capital, in order for the funds to establish a performance history for newly launched strategies. These funds may meet the definition of variable interest entities, as defined by U.S. GAAP, and if we are deemed to be the primary beneficiary of these funds, we may be required to consolidate these funds in our consolidated financial statements under U.S. GAAP. The funds follow specialized investment company accounting rules which prescribe fair value for the underlying investment securities held by the funds.

In the aggregate, we expect any financial losses that we realize over time from these seed investments to be limited to the actual amount invested in the consolidated fund. However, in the event of a fund wind-down, gross gains and losses of the fund may be recognized for financial accounting purposes in different periods during the time the fund is consolidated but not wholly owned. Although we expect the actual economic loss to be limited to the amount invested, our losses in any period for financial accounting purposes could exceed the value of our economic interests in the fund and could exceed the value of our initial seed capital investment.

In instances where we are not deemed to be the primary beneficiary of the sponsored investment fund, we do not include the funds in our consolidated financial statements. Our risk of loss associated with investment in these unconsolidated funds primarily represents our seed capital investment, which could become realized as a result of poor investment performance. However, the amount of loss we may recognize during any period

would be limited to the carrying amount of our investment.

Our reputation and business prospects may be damaged if our clients incur substantial losses in investment pools in which we act as agent or are restricted in redeeming their interests in these investment pools.

We manage assets on behalf of clients in several forms, including, without limitation, in collective investment pools, money market funds, securities finance collateral pools, cash collateral and other cash products and short-term investment funds. Our management of collective investment pools on behalf of clients exposes us to reputational risk and operational losses. If our clients incur substantial investment losses in these pools, receive redemptions as in-kind distributions rather than in cash, or experience significant under-performance relative to the market or our competitors' products, our reputation could be significantly harmed, which harm could significantly and adversely affect the prospects of our associated business units. Because we often implement investment and operational decisions and actions over multiple investment pools to achieve scale, we face the risk that losses, even small losses, may have a significant effect in the aggregate.

Within our Investment Management business, we manage investment pools, such as mutual funds and collective investment funds that generally offer our clients the ability to withdraw their investments on short notice, generally daily or monthly. This feature requires that we manage those pools in a manner that takes into account both maximizing the long-term return on the investment pool and retaining sufficient liquidity to meet reasonably anticipated liquidity requirements of our clients. The importance of maintaining liquidity varies by product type, but it is a particularly important feature in money market funds and other products designed to maintain a constant net asset value of \$1.00. In the past, we have imposed restrictions on cash redemptions from the agency lending collateral pools, as the per-unit market value of those funds' assets had declined below the constant \$1.00 the funds employ to

effect purchase and redemption transactions. Both the decline of the funds' net asset value below \$1.00 and the imposition of restrictions on redemptions had a significant client, reputational and regulatory impact on us, and the recurrence of such or similar circumstances in the future could adversely impact our consolidated results of operations and financial condition. We have also in the past continued to process purchase and redemption of units of investment products designed to maintain a constant net asset value at \$1.00 although the fair market value of the fund's assets were less than \$1.00. If in the future we were to continue to process purchases and redemptions from such products at \$1.00 when the fair market value of our collateral pools' assets is less than \$1.00, we could be exposed to significant liability.

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If higher than normal demands for liquidity from our clients were to occur, managing the liquidity requirements of our collective investment pools could become more difficult. If such liquidity problems were to recur, our relationships with our clients may be adversely affected, and, we could, in certain circumstances, be required to consolidate the investment pools into our consolidated statement of condition; levels of redemption activity could increase; and our consolidated results of operations and business prospects could be adversely affected. In addition, if a money market fund that we manage were to have unexpected liquidity demands from investors in the fund that exceeded available liquidity, the fund could be required to sell assets to meet those redemption requirements, and selling the assets held by the fund at a reasonable price, if at all, may then be difficult.

Because of the size of the investment pools that we manage, we may not have the financial ability or regulatory authority to support the liquidity or other demands of our clients. Any decision by us to provide financial support to an investment pool to support our reputation in circumstances where we are not statutorily or contractually obligated to do so could result in the recognition of significant losses, could adversely affect the regulatory view of our capital levels or plans and could, in some cases, require us to consolidate the investment pools into our consolidated statement of condition. Any failure of the pools to meet redemption requests, or under-performance of our pools relative to similar products offered by our competitors, could harm our business and our reputation.

Competition for our employees is intense, and we may not be able to attract and retain the highly skilled people we need to support our business.

Our success depends, in large part, on our ability to attract and retain key people. Competition for the best people in most activities in which we engage can be intense, and we may not be able to hire people or retain them, particularly in light of challenges associated with evolving compensation restrictions applicable, or which may become applicable, to banks and some asset managers and that potentially are not applicable to other financial services firms in all jurisdictions or to technology firms, generally. The unexpected loss of services of key personnel in business units, control functions, information technology, operations or other areas could have a material adverse impact on our business because of their skills, their knowledge of our markets, operations and clients, their years of industry experience and, in some cases, the difficulty of promptly finding qualified replacement personnel. Similarly, the loss of key employees, either individually or as a group, could adversely affect our clients' perception of our ability to continue to manage certain types of investment management mandates to provide other services to them or to maintain a culture of innovation and proficiency.

We are subject to intense competition in all aspects of our business, which could negatively affect our ability to maintain or increase our profitability.

The markets in which we operate across all facets of our business are both highly competitive and global. These markets are changing as a result of new and evolving laws and regulations applicable to financial services institutions. Regulatory-driven market changes cannot always be anticipated, and may adversely affect the demand for, and profitability of, the products and services that we offer. In addition, new market entrants and competitors may address changes in the markets more rapidly than we do, or may provide clients with a more attractive offering of products and services, adversely affecting our business. Our efforts to develop and market new products, particularly in the "Fintech" sector, may position us in new markets with pre-existing competitors with strong market position. We have also experienced, and anticipate that we will continue to experience, significant pricing pressure in many of our core businesses, particularly our custodial and investment management services. This pricing pressure has and may continue to impact our revenue growth and operational margins and may limit the positive impact of new client demand and growth in AUC/A. Many of our businesses compete with other domestic and international banks and financial services companies, such as custody banks, investment advisors, broker/dealers, outsourcing companies and data processing companies. Further consolidation within the financial services industry could also pose challenges to us in the markets we serve, including, without limitation, potentially increased downward pricing pressure across our businesses.

Some of our competitors including, without limitation, our competitors in core services, have substantially greater capital resources than we do or are not subject to as stringent capital or other regulatory requirements as are we. In some of our businesses, we are service providers to significant competitors. These competitors are in some instances

significant clients, and the retention of these clients involves additional risks, such as the avoidance of actual or perceived conflicts of interest and the maintenance of high levels of service quality and intra-company confidentiality. The ability of a competitor to offer comparable or improved products or services at a lower price would likely negatively affect our ability to maintain or increase our profitability. Many of our core services are subject to contracts that have relatively short terms or may be terminated by our client after a short notice period. In addition, pricing pressures as a result of the activities of competitors, client pricing reviews, and rebids, as well as the introduction of new products, may result in a reduction in the prices we can charge for our products and services.

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Long-term contracts expose us to pricing and performance risk.

We enter into long-term contracts to provide middle office or investment manager and alternative investment manager operations outsourcing services to clients, including, without limitation, services related to certain trading activities, cash reporting, settlement and reconciliation activities, collateral management and information technology development. We also may enter into longer-term arrangements with respect to custody, fund administration and depository services. These arrangements generally set forth our fee schedule for the term of the contract and, absent a change in service requirements, do not permit us to re-price the contract for changes in our costs or for market pricing. The long-term contracts for these relationships require, in some cases, considerable up-front investment by us, including, without limitation, technology and conversion costs, and carry the risk that pricing for the products and services we provide might not prove adequate to generate expected operating margins over the term of the contracts. The profitability of these contracts is largely a function of our ability to accurately calculate pricing for our services, efficiently assume our contractual responsibilities in a timely manner, control our costs and maintain the relationship with the client for an adequate period of time to recover our up-front investment. Our estimate of the profitability of these arrangements can be adversely affected by declines in the assets under the clients' management, whether due to general declines in the securities markets or client-specific issues. In addition, the profitability of these arrangements may be based on our ability to cross-sell additional services to these clients, and we may be unable to do so. In addition, such contracts may permit early termination or reduction in services in the event that certain service levels are not met, which termination or service reduction may result in loss of upfront investment in onboarding the client. Performance risk exists in each contract, given our dependence on successful conversion and implementation onto our own operating platforms of the service activities provided. Our failure to meet specified service levels or implementation timelines may also adversely affect our revenue from such arrangements, or permit early termination of the contracts by the client. If the demand for these types of services were to decline, we could see our revenue decline.

Changes in accounting standards may adversely affect our consolidated financial statements.

New accounting standards, or changes to existing accounting standards, resulting both from initiatives of the FASB as well as changes in the interpretation of existing accounting standards, by the FASB or the SEC or otherwise reflected in U.S. GAAP, potentially could affect our consolidated results of operations, cash flows

and financial condition. These changes can materially affect how we record and report our consolidated results of operations, cash flows, financial condition and other financial information. In some cases, we could elect, or be required, to apply a new or revised standard retroactively, resulting in the revised treatment of certain transactions or activities, and, in some cases, the revision of our consolidated financial statements for prior periods. For additional information regarding changes in accounting standards, refer to the "Recent Accounting Developments" section of Note 1 to the consolidated financial statements in this Form 10-K.

Changes in tax laws, rules or regulations, challenges to our tax positions with respect to historical transactions, and changes in the composition of our pre-tax earnings may increase our effective tax rate and thus adversely affect our consolidated financial statements.

Our businesses can be directly or indirectly affected by new tax legislation, the expiration of existing tax laws or the interpretation of existing tax laws worldwide. On December 22, 2017, the United States enacted the Tax Cuts and Jobs Act (TCJA), generally effective January 2018. This decreased the U.S. corporate income tax rate from 35% to 21%, repealed the corporate alternative minimum tax and replaced the existing worldwide tax system with a modified territorial system. The modified territorial system eliminates income tax on foreign dividends and introduces new provisions that generate incremental tax on foreign earnings, base erosion payments and limit the benefit of foreign tax credits.

The U.S. Treasury has yet to issue final guidance for key provisions of the TCJA, including the Base Erosion and Anti-abuse tax, Global Intangible Low-taxed Income and foreign tax credit provisions. Depending on how those provisions are ultimately implemented, our effective tax rate could be adversely affected.

U.S. state governments, including Massachusetts, and jurisdictions around the world continue to review proposals to amend tax laws, rules and regulations applicable to our businesses that could have a negative impact on our capital or

after-tax earnings. In the normal course of our business, we are subject to review by U.S. and non-U.S. tax authorities. A review by any such authority could result in an increase in our recorded tax liability. In addition to the aforementioned risks, our effective tax rate is dependent on the nature and geographic composition of our pre-tax earnings and could be negatively affected by changes in these factors.

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We may incur losses as a result of unforeseen events including, without limitation, terrorist attacks, natural disasters, the emergence of a pandemic or acts of embezzlement.

Acts of terrorism, natural disasters or the emergence of a pandemic could significantly affect our business. We have instituted disaster recovery and continuity plans to address risks from terrorism, natural disasters and pandemic; however, anticipating or addressing all potential contingencies is not possible for events of this nature. Acts of terrorism, either targeted or broad in scope, or natural disasters could damage our physical facilities, harm our employees and disrupt our operations. A pandemic, or concern about a possible pandemic, could lead to operational difficulties and impair our ability to manage our business. Acts of terrorism, natural disasters and pandemics could also negatively affect our clients, counterparties and service providers, as well as result in disruptions in general economic activity and the financial markets.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Our headquarters is located at State Street Financial Center, One Lincoln Street, Boston, Massachusetts, a 36-story leased office building. Various divisions of our two lines of business, as well as support functions, occupy space in this building. We occupy four buildings located in Quincy, Massachusetts, one of which we own and three of which we lease, along with the Channel Center, another leased office building located in Boston, all of which function as our principal facilities.

We occupy a total of approximately 8.0 million square feet of office space and related facilities worldwide, of which approximately 7.0 million square feet are leased. The following table provides information on certain of our office space and related facilities:

Principal Properties ⁽¹⁾	City	State/ Country	Owned/ Leased
U.S. and Canada:			
State Street Financial Center	Boston	MA	Leased
Channel Center	Boston	MA	Leased
Summer Street	Boston	MA	Leased
District Avenue	Burlington	MA	Leased
Crown Colony Drive	Quincy	MA	Leased
Heritage Drive	Quincy	MA	Leased
John Adams Building	Quincy	MA	Owned
Josiah Quincy Building	Quincy	MA	Leased
Grafton Data Center	Grafton	MA	Owned
Westborough Data Center	Westborough	MA	Owned
Summer Street	Stamford	CT	Leased
Pennsylvania Avenue	Kansas City	MO	Leased
College Road East	Princeton	NJ	Leased
Avenue of the Americas	New York	NY	Leased
Adelaide Street East	Toronto	Canada	Leased
Europe, Middle East and Africa:			
Churchill Place	London	England	Leased
Brienner Strasse	Munich	Germany	Leased
Sir John Rogerson's Quay	Dublin	Ireland	Leased
Via Ferrante Aporti	Milan	Italy	Leased
Kirchberg	Luxembourg	Luxembourg	Leased
Titanium Tower	Gdansk	Poland	Leased

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BIG	Krakow	Poland	Leased
Bonarka	Krakow	Poland	Leased
CBK	Krakow	Poland	Leased

Asia Pacific:

George Street	Sydney	Australia	Leased
San Dun	Hangzhou	China	Leased
Tian Tang	Hangzhou	China	Leased
Ecoworld 6B	Bangalore	India	Leased
Knowledge City Salarpuria	Hyderabad	India	Leased
RMZ Ecoworld 7	Bangalore	India	Leased

(1) We lease other properties in the above regions which consists of 41 locations in the U.S. and Canada, 39 locations in EMEA and 37 locations in APAC.

ITEM 3. LEGAL PROCEEDINGS

The information required by this Item is provided under "Legal and Regulatory Matters" in Note 13 to the consolidated financial statements in this Form 10-K, and is incorporated herein by reference.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

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EXECUTIVE OFFICERS OF THE REGISTRANT

The following table presents certain information with respect to each of our executive officers as of February 21, 2019.

Name	Age	Position
Ronald P. O'Hanley	62	Chief Executive Officer and President
Eric W. Aboaf	54	Executive Vice President and Chief Financial Officer
Ian W. Appleyard	54	Executive Vice President, Global Controller and Chief Accounting Officer
Jeffrey N. Carp	62	Executive Vice President, Chief Legal Officer and Secretary
Jeff D. Conway	53	Executive Vice President, Global Head of Operations and Business Transformation
Andrew J. Erickson	49	Executive Vice President, Head of Global Services
Hannah M. Grove	55	Executive Vice President and Chief Marketing Officer
Kathryn M. Horgan	53	Executive Vice President and Chief Human Resources and Citizenship Officer
Karen C. Keenan	56	Executive Vice President and Chief Administrative Officer
Andrew P. Kuritzkes	58	Executive Vice President and Chief Risk Officer
Louis D. Maiuri	54	Executive Vice President, Head of Global Markets and Global Exchange
Donna M. Milrod	51	Executive Vice President and Head of Global Clients Division
Elizabeth Nolan	56	Executive Vice President, Chief Executive Officer for Europe, Middle East and Africa
Antoine Shagoury	48	Executive Vice President and Global Chief Information Officer
Cyrus Taraporevala	52	President and Chief Executive Officer, State Street Global Advisors

All executive officers are appointed by the Board of Directors and hold office at the discretion of the Board. No family relationships exist among any of our directors and executive officers.

In accordance with the Chief Executive Officer succession plan previously announced in November 2018, Mr. O'Hanley succeeded Joseph L. Hooley as Chief Executive Officer on January 1, 2019.

Mr. O'Hanley joined State Street in April 2015 and since January 1, 2019 has served as the President and Chief Executive Officer. Prior to this role Mr. O'Hanley served as President and Chief Operating Officer from November 2017 to December 2018 and served as Vice Chairman from January 1, 2017 to November 2017. He served as the Chief Executive Officer and President of State Street Global Advisors, the investment management arm of State Street Corporation from April 2015 to November 2017. Prior to joining State Street, Mr. O'Hanley was president of Asset Management & Corporate Services for Fidelity Investments, a financial and mutual fund services corporation, from 2010 to February 2014. From 1997 to 2010, Mr. O'Hanley served in various positions at Bank of New York Mellon, a global banking and financial services corporation, serving as president and chief executive officer of BNY Asset Management in Boston from 2007 to 2010.

Mr. Aboaf joined State Street in December 2016 as Executive Vice President and has served as Executive Vice President and Chief Financial Officer since February 2017. Prior to joining State Street, Mr. Aboaf served as chief financial officer of Citizens Financial Group, a financial services and retail banking firm, from April 2015 to December 2016, with responsibility for all finance functions and corporate development. From 2003 to March 2015, he served in several senior management positions for Citigroup, a

global investment banking and financial services corporation, including as global treasurer and as the chief financial officer of the institutional client group, which included the custody business.

Mr. Appleyard joined State Street in May 2018 as Executive Vice President, Global Controller and Chief Accounting Officer. Prior to joining State Street, Mr. Appleyard served as managing director in group finance for Credit Suisse, a provider of financial services, from May 2013 to April 2018 and held several senior management positions with Credit Suisse after joining in September 2008. Prior to Credit Suisse, Mr. Appleyard held senior positions at HSBC and JPMorgan.

Mr. Carp joined State Street in 2006 as Executive Vice President and Chief Legal Officer. Later in 2006, he was also appointed Secretary. From 2004 to 2005, Mr. Carp served as executive vice president and general counsel of Massachusetts Financial Services, an investment management and research company. From 1989 until 2004, Mr. Carp was a senior partner at the law firm of Hale and Dorr LLP, where he was an attorney since 1982. Mr. Carp served as

State Street's interim chief risk officer from February 2010 until September 2010.

Mr. Conway joined State Street more than 30 years ago and serves as Executive Vice President and head of Global Delivery. Prior to his current role, he was Chief Executive Officer for Europe, the Middle East and Africa from March 2015 until December 2017. Prior to that role, Mr. Conway held several other management positions within the Company, including leading Global Exchange from April 2013 to March 2015. From 2007 to April 2013, Mr. Conway served as the global head of our Investment Management Services business.

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Mr. Erickson joined State Street in April 1991 and since November 2017 has served as Executive Vice President and head of our Global Services business. Prior to this role and commencing in June 2016, he served as Executive Vice President and head of Investment Services business in the Americas. Prior to that role, Mr. Erickson was the head of our Global Services business in Asia Pacific from April 2014 to June 2016 and prior to that was head of North Asia for Global Services from 2010 to April 2014. Mr. Erickson has also held several other positions within State Street during his over 25 years with the Company.

Ms. Grove joined State Street in 1998 and currently serves as Executive Vice President and Chief Marketing Officer, a role she has been in since 2008. Prior to this role, Ms. Grove served as Senior Vice President for State Street's Global Marketing division. Prior to joining State Street, Ms. Grove was the marketing director for World Times' Money Matters Institute, a collaboration between the United Nations and the World Bank that sought to foster sustainable development in emerging economies.

Ms. Horgan joined State Street in April 2009 and has served as Executive Vice President and Chief Human Resources and Citizenship Officer since March 2017. Prior to March 2017, she served as Executive Vice President from 2012, and Chief Operating Officer, from 2011, for State Street's Global Human Resources division. Prior to that role, Ms. Horgan served as the Senior Vice President of Human Resources for State Street Global Advisors. Prior to joining State Street, Ms. Horgan was the executive vice president of human resources for Old Mutual Asset Management, a global, diversified multi-boutique asset management company, from 2006 to 2009.

Ms. Keenan joined State Street in July 2007 as part of the acquisition of Investors Financial Services (IBT) and since June 2016 has served as Executive Vice President and Chief Administrative Officer, managing cross-organizational initiatives, overseeing data strategy projects, overseeing the Compliance Department and leading key components of regulatory initiatives. Prior to this role, from July 2015 to June 2016, Ms. Keenan led the Global Markets division worldwide, following her role as the head of Global Markets in EMEA from 2012 to 2016. From 2010 to 2012, Ms. Keenan served as the Chief Strategy Officer for Global Markets. While with IBT, she served as chief financial officer during its initial public offering and its early years as a public company.

Mr. Kuritzkes joined State Street in 2010 as Executive Vice President and Chief Risk Officer. Prior to joining State Street, Mr. Kuritzkes was a partner at Oliver, Wyman & Company, an international management consulting firm, and led the firm's Public Policy practice in North America. He joined Oliver, Wyman & Company in 1988, was a managing director in the firm's London office from 1993 to 1997, and

served as vice chairman of Oliver, Wyman & Company globally from 2000 until the firm's acquisition by MMC in 2003. From 1986 to 1988, he worked as an economist and lawyer for the Federal Reserve Bank of New York.

Mr. Maiuri joined State Street in October 2013 and has served as Executive Vice President and head of State Street Global Markets since June 2016 and head of State Street Global Exchange since July 2015. From 2013 to July 2015, he led State Street's Securities Finance division. Before joining State Street, Mr. Maiuri served as executive vice president and deputy chief executive officer of asset servicing at BNY Mellon, a global banking and financial services corporation, from 2009 to 2013.

Ms. Milrod joined State Street in December 2018 as Executive Vice President and Head of Global Clients Division. Prior to joining State Street, Ms. Milrod was most recently a senior advisor to Broadridge Financial Solutions, a provider of investor communications and technology-driven solutions to banks, broker/dealers, asset managers and corporate issuers globally, from January 2018 through November 2018 and senior advisor to McKinsey & Co, a global management consulting firm, from May 2017 to June 2018. Ms. Milrod served as head of DTCC Solutions at the Depository Trust & Clearing Corporation, a provider of information-based and business processing solutions to financial intermediaries globally, from February 2015 to November 2016 and before that served as chief administrative officer, leading operations and finance, from October 2012 to February 2015. Ms. Milrod held several senior positions with Deutsche Bank from 1993 to 2012.

Ms. Nolan joined State Street in October 2015 and serves as Chief Executive Officer for Europe, the Middle East and Africa. Prior to that, she served as Executive Vice President and co-head of State Street Global Services for Europe, the Middle East and Africa from January 2017 to January 2018. Prior to that role, she served as head of European Banking from October 2015 to January 2017. Before joining State Street, from January 2015 to October 2015, Ms.

Nolan served as managing director at Deutsche Bank in the global custody and clearing business. Prior to that role, Ms. Nolan spent 12 years at J.P. Morgan in various senior leadership roles, including from 2009 to 2014 as the head of client services and client onboarding globally for markets and investor services.

Mr. Shagoury joined State Street in November 2015 as Executive Vice President, Information Technology and Global Chief Information Officer. Prior to joining State Street, Mr. Shagoury had several senior management positions from 2010 to November 2015 with the London Stock Exchange Group, a British-based stock exchange and financial information company, including the group chief operating officer and chief information officer.

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Mr. Taraporevala joined State Street in April 2016 and since November 2017 has served as President and Chief Executive Officer of State Street Global Advisors. He joined State Street Global Advisors as Executive Vice President and Global Head of Product and Marketing. Prior to joining State Street Global Advisors, Mr. Taraporevala was the head of Retail Management Accounts and Life Insurance & Annuities for Fidelity Investments from 2012 to October 2015. Prior to that, Mr. Taraporevala held senior leadership roles at BNY Mellon Asset Management, including executive director of North American distribution.

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PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

MARKET FOR REGISTRANT'S COMMON EQUITY

Our common stock is listed on the New York Stock Exchange under the ticker symbol STT. There were 2,503 shareholders of record as of January 31, 2019.

In June 2018, our Board approved a common stock purchase program authorizing the purchase of up to \$1.2 billion of our common stock through June 30, 2019 (the 2018 Program).

In connection with our acquisition of Charles River Development, we did not repurchase any common stock during the second, third and fourth quarters of 2018. We resumed our common stock purchase program in the first quarter of 2019 and may repurchase up to \$600 million through June 30, 2019 under the 2018 Program.

Stock purchases may be made using various types of mechanisms, including open market purchases or transactions off market, and may be made under Rule 10b5-1 trading programs. The timing of stock purchases, types of transactions and number of shares purchased will depend on several factors, including market conditions, our capital position, our financial performance and investment opportunities. Our common stock purchase program does not have specific price targets and may be suspended at any time. We may employ third-party broker/dealers to acquire shares on the open market in connection with our common stock purchase programs.

Additional information about our common stock, including Board authorization with respect to purchases by us of our common stock, is provided under "Capital" in "Financial Condition" in our Management's Discussion and Analysis and in Note 15 to the consolidated financial statements in this Form 10-K, and is incorporated herein by reference.

RELATED STOCKHOLDER MATTERS

As a bank holding company, our Parent Company is a legal entity separate and distinct from its principal banking subsidiary, State Street Bank, and its non-banking subsidiaries. The right of the Parent Company to participate as a shareholder in any distribution of assets of State Street Bank upon its liquidation, reorganization or otherwise is subject to the prior claims by creditors of State Street Bank, including obligations for federal funds purchased and securities sold under repurchase agreements and deposit liabilities.

Payment of dividends by State Street Bank is subject to the provisions of the Massachusetts banking law, which provide that State Street Bank's Board of Directors may declare, from State Street Bank's "net profits," as defined below, cash dividends annually,

semi-annually or quarterly (but not more frequently) and can declare non-cash dividends at any time. Under Massachusetts banking law, for purposes of determining the amount of cash dividends that are payable by State Street Bank, "net profits" is defined as an amount equal to the remainder of all earnings from current operations plus actual recoveries on loans and investments and other assets, after deducting from the total thereof all current operating expenses, actual losses, accrued dividends on preferred stock, if any, and all federal and state taxes.

No dividends may be declared, credited or paid so long as there is any impairment of State Street Bank's capital stock. The approval of the Massachusetts Commissioner of Banks is required if the total of all dividends declared by State Street Bank in any calendar year would exceed the total of its net profits for that year combined with its retained net profits for the preceding two years, less any required transfer to surplus or to a fund for the retirement of any preferred stock.

Under Federal Reserve regulations, the approval of the Federal Reserve would be required for the payment of dividends by State Street Bank if the total amount of all dividends declared by State Street Bank in any calendar year, including any proposed dividend, would exceed the total of its net income for such calendar year as reported in State Street Bank's Consolidated Reports of Condition and Income for a Bank with Domestic and Foreign Offices Only - FFIEC 031, commonly referred to as the "Call Report," as submitted through the Federal Financial Institutions Examination Council and provided to the Federal Reserve, plus its "retained net income" for the preceding two calendar years. For these purposes, "retained net income," as of any date of determination, is defined as an amount equal to State Street Bank's net income (as reported in its Call Reports for the calendar year in which retained net income is being determined) less any dividends declared during such year. In determining the amount of dividends that are payable,

the total of State Street Bank's net income for the current year and its retained net income for the preceding two calendar years is reduced by any net losses incurred in the current or preceding two-year period and by any required transfers to surplus or to a fund for the retirement of preferred stock.

Prior Federal Reserve approval also must be obtained if a proposed dividend would exceed State Street Bank's "undivided profits" (retained earnings) as reported in its Call Reports. State Street Bank may include in its undivided profits amounts contained in its surplus account, if the amounts reflect transfers of undivided profits made in prior periods and if the Federal Reserve's approval for the transfer back to undivided profits has been obtained.

Under the PCA provisions adopted pursuant to the FDIC Improvement Act of 1991, State Street Bank may not pay a dividend when it is deemed, under the PCA

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framework, to be under-capitalized, or when the payment of the dividend would cause State Street Bank to be under-capitalized. If State Street Bank is under-capitalized for purposes of the PCA framework, it must cease paying dividends for so long as it is deemed to be under-capitalized. Once earnings have begun to improve and an adequate capital position has been restored, dividend payments may resume in accordance with federal and state statutory limitations and guidelines.

Currently, any payment of future common stock dividends by our Parent Company to its shareholders is subject to the review of our capital plan by the Federal Reserve in connection with its CCAR process. Information about dividends declared by our Parent Company and dividends from our subsidiary banks is provided under "Capital" in "Financial Condition" in our Management's Discussion and Analysis, and in Note 15 to the consolidated financial statements in this Form 10-K, and is incorporated herein by reference. Future dividend payments of State Street Bank and our non-banking subsidiaries cannot be determined at this time. In addition, refer to "Capital Planning, Stress Tests and Dividends" in "Supervision and Regulation" in Business in this Form 10-K and the risk factor "Our business and capital-related activities, including our ability to return capital to shareholders and repurchase our capital stock, may be adversely affected by our implementation of regulatory capital and liquidity standards that we must meet or in the event our capital plan or post-stress capital ratios are determined to be insufficient as a result of regulatory capital stress testing" in Risk Factors in this Form 10-K.

Information about our equity compensation plans is in Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters, and in Note 18 to the consolidated financial statements in this Form 10-K, and is incorporated herein by reference.

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SHAREHOLDER RETURN PERFORMANCE PRESENTATION

The graph presented below compares the cumulative total shareholder return on our common stock to the cumulative total return of the S&P 500 Index, the S&P Financial Index and the KBW Bank Index over a five-year period. The cumulative total shareholder return assumes the investment of \$100 in our common stock and in each index on December 31, 2013. It also assumes reinvestment of common stock dividends.

The S&P Financial Index is a publicly available, capitalization-weighted index, comprised of 68 of the Standard & Poor's 500 companies, representing 27 diversified financial services companies, 22 insurance companies and 19 banking companies. The KBW Bank Index is a modified cap-weighted index consisting of 24 exchange-listed stocks, representing national money center banks and leading regional institutions.

	2013	2014	2015	2016	2017	2018
State Street Corporation	\$ 100	\$ 109	\$ 94	\$ 112	\$ 143	\$ 95
S&P 500 Index	100	114	115	129	157	150
S&P Financial Index	100	115	113	139	170	148
KBW Bank Index	100	109	110	141	168	138

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ITEM 6. SELECTED FINANCIAL DATA

(Dollars in millions, except per share amounts or where otherwise noted)

YEARS ENDED DECEMBER 31:	2018	2017	2016	2015	2014	
Total fee revenue	\$9,305	\$8,905	\$8,116	\$8,278	\$8,010	
Net interest income	2,671	2,304	2,084	2,088	2,260	
Gains (losses) related to investment securities, net	6	(39)	7	(6)	4	
Total revenue	11,982	11,170	10,207	10,360	10,274	
Provision for loan losses	15	2	10	12	10	
Total expenses	8,968	8,269	8,077	8,050	7,827	
Income before income tax expense	2,999	2,899	2,120	2,298	2,437	
Income tax expense (benefit)	400	722	(22)	318	415	
Net income from non-controlling interest	—	—	1	—	—	
Net income	\$2,599	\$2,177	\$2,143	\$1,980	\$2,022	
Adjustments to net income ⁽¹⁾	(189)	(184)	(175)	(132)	(64)	
Net income available to common shareholders	\$2,410	\$1,993	\$1,968	\$1,848	\$1,958	
PER COMMON SHARE:						
Earnings per common share:						
Basic	\$6.48	\$5.32	\$5.03	\$4.53	\$4.62	
Diluted	6.40	5.24	4.97	4.47	4.53	
Cash dividends declared	1.78	1.60	1.44	1.32	1.16	
Closing market price (at year end)	63.07	97.61	77.72	66.36	78.50	
AS OF DECEMBER 31:						
Investment securities	\$87,062	\$97,579	\$97,167	\$100,022	\$112,636	
Average total interest-earning assets	185,637	191,235	199,184	220,456	209,054	
Total assets	244,626	238,425	242,698	245,155	274,089	
Deposits	180,360	184,896	187,163	191,627	209,040	
Long-term debt	11,093	11,620	11,430	11,497	10,012	
Total shareholders' equity	24,790	22,317	21,219	21,103	21,328	
Assets under custody and/or administration (in billions)	31,620	33,119	28,771	27,508	28,188	
Assets under management (in billions)	2,511	2,782	2,468	2,245	2,448	
Number of employees	40,142	36,643	33,783	32,356	29,970	
RATIOS:						
Return on average common shareholders' equity	12.2	% 10.6	% 10.5	% 9.8	% 9.8	%
Return on average assets	1.16	0.99	0.93	0.79	0.85	
Common dividend payout	27.58	29.89	28.46	28.99	25.03	
Average common equity to average total assets	8.9	8.6	8.2	7.6	8.4	
Net interest margin, fully taxable-equivalent basis	1.47	1.29	1.13	1.03	1.16	
Common equity tier 1 ratio ⁽²⁾	12.1	12.3	11.7	12.5	12.4	
Tier 1 capital ratio ⁽²⁾	16.0	15.5	14.8	15.3	14.5	
Total capital ratio ⁽²⁾	16.9	16.5	16.0	17.4	16.4	
Tier 1 leverage ratio ⁽³⁾	7.2	7.3	6.5	6.9	6.3	
Supplementary leverage ratio ⁽⁴⁾	6.3	6.5	5.9	6.2	5.6	

⁽¹⁾ Amounts represent preferred stock dividends and the allocation of earnings to participating securities using the two-class method.

⁽²⁾ Ratios were calculated in conformity with the advanced approaches provisions of the Basel III final rule. Refer to Note 16 to the consolidated financial statements in this Form 10-K.

(3) The tier 1 leverage ratio was calculated in conformity with the Basel III final rule.

(4) The supplementary leverage ratio was calculated using the tier 1 capital as calculated under the supplementary leverage ratio provisions of the Basel III final rule.

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We use acronyms and other defined terms for certain business terms and abbreviations, as defined on the acronyms list and glossary following the consolidated financial statements in this Form 10-K.

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MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION
AND RESULTS OF OPERATIONS

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF
OPERATIONS
GENERAL

As of December 31, 2018, we had consolidated total assets of \$244.63 billion, consolidated total deposits of \$180.36 billion, consolidated total shareholders' equity of \$24.79 billion and over 40,000 employees. We operate in more than 100 geographic markets worldwide, including the U.S., Canada, Europe, the Middle East and Asia.

Our operations are organized into two lines of business, Investment Servicing and Investment Management, which are defined based on products and services provided.

Investment Servicing provides services for institutional clients, including mutual funds, collective investment funds and other investment pools, corporate and public retirement plans, insurance companies, investment managers, foundations and endowments worldwide. Products include: custody; product and participant level accounting; daily pricing and administration; master trust and master custody; depotbank services (a fund oversight role created by regulation); record-keeping; cash management; foreign exchange, brokerage and other trading services; securities finance; our enhanced custody product, which integrates principal securities lending and custody; deposit and short-term investment facilities; loans and lease financing; investment manager and alternative investment manager operations outsourcing; performance, risk and compliance analytics; and financial data management to support institutional investors. New products and services resulting from our acquisition of Charles River Development on October 1, 2018 include: portfolio modeling and construction; trade order management; investment risk and compliance; and wealth management solutions.

Investment Management, through State Street Global Advisors, provides a broad range of investment management strategies and products for our clients. Our investment management strategies and products span the risk/reward spectrum, including core and enhanced indexing, multi-asset strategies, active quantitative and fundamental active capabilities and alternative investment strategies. Our AUM is currently primarily weighted to indexed strategies. In addition, we provide a breadth of services and solutions, including environmental, social and governance investing, defined benefit and defined contribution and OCIO. State Street Global Advisors is also a provider of ETFs, including the SPDR® ETF brand. While management fees are primarily determined by the values of AUM and the investment strategies employed, management fees reflect other factors as well, including the benchmarks

specified in the respective management agreements related to performance fees.

For financial and other information about our lines of business, refer to "Line of Business Information" in this Management's Discussion and Analysis and Note 24 to the consolidated financial statements in this Form 10-K.

This Management's Discussion and Analysis should be read in conjunction with the consolidated financial statements and accompanying notes to consolidated financial statements in this Form 10-K. Certain previously reported amounts presented in this Form 10-K have been reclassified to conform to current-period presentation.

We prepare our consolidated financial statements in conformity with U.S. GAAP. The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions in its application of certain accounting policies that materially affect the reported amounts of assets, liabilities, equity, revenue and expenses.

The significant accounting policies that require us to make judgments, estimates and assumptions that are difficult, subjective or complex about matters that are uncertain and may change in subsequent periods include:

- accounting for fair value measurements;
- impairment of goodwill and other intangible assets; and
- contingencies.

These significant accounting policies require the most subjective or complex judgments, and underlying estimates and assumptions could be subject to revision as new information becomes available. Additional information about these significant accounting policies is included under "Significant Accounting Estimates" in this Management's Discussion and Analysis.

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Certain financial information provided in this Form 10-K, including this Management's Discussion and Analysis, is prepared on both a U.S. GAAP, or reported basis, and a non-GAAP basis, including certain non-GAAP measures used in the calculation of identified regulatory ratios. We measure and compare certain financial information on a non-GAAP basis, including information (such as capital ratios calculated under regulatory standards scheduled to be effective in the future) that management uses in evaluating our business and activities.

Non-GAAP financial information should be considered in addition to, and not as a substitute for or superior to, financial information prepared in conformity with U.S. GAAP. Any non-GAAP financial information presented in this Form 10-K, including this Management's Discussion and Analysis, is reconciled

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MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

to its most directly comparable currently applicable regulatory ratio or U.S. GAAP-basis measure.

We further believe that our presentation of fully taxable-equivalent NII, a non-GAAP measure, which reports non-taxable revenue, such as interest income associated with tax-exempt investment securities, on a fully taxable-equivalent basis, facilitates an investor's understanding and analysis of our underlying financial performance and trends.

This Management's Discussion and Analysis contains statements that are considered "forward-looking statements" within the meaning of U.S. securities laws. Forward-looking statements include statements about our goals and expectations regarding our business, financial and capital condition, results of operations, strategies, financial portfolio performance, dividend and stock purchase programs, expected outcomes of legal proceedings, market growth, acquisitions, joint ventures and divestitures and new technologies, services and opportunities, as well as industry, regulatory, economic and market trends, initiatives and developments, the business environment and other matters that do not relate strictly to historical facts. These forward-looking statements involve certain risks and uncertainties which could cause actual results to differ materially. We undertake no obligation to revise the forward-looking statements contained in this Management's Discussion and Analysis to reflect events after the time we file this Form 10-K with the SEC. Additional information about forward-looking statements and related risks and uncertainties is provided in "Risk Factors" in this Form 10-K.

We provide additional disclosures required by applicable bank regulatory standards, including supplemental qualitative and quantitative information with respect to regulatory capital (including market risk associated with our trading activities) and the liquidity coverage ratio, summary results of semi-annual State Street-run stress tests which we conduct under the Dodd-Frank Act and resolution plan disclosures required under the Dodd-Frank Act. These additional disclosures are accessible on the "Investor Relations" section of our corporate website at www.statestreet.com.

We have included our website address in this report as an inactive textual reference only. Information on our website is not incorporated by reference in this Form 10-K.

We use acronyms and other defined terms for certain business terms and abbreviations, as defined on the acronyms list and glossary in this Form 10-K.

OVERVIEW OF FINANCIAL RESULTS

TABLE 1: OVERVIEW OF FINANCIAL RESULTS

	Years Ended December 31,		
(Dollars in millions, except per share amounts)	2018	2017	2016
Total fee revenue ⁽¹⁾⁽²⁾⁽³⁾	\$9,305	\$8,905	\$8,116
Net interest income ⁽²⁾	2,671	2,304	2,084
Gains (losses) related to investment securities, net	6	(39)	7
Total revenue ⁽¹⁾⁽³⁾	11,982	11,170	10,207
Provision for loan losses	15	2	10
Total expenses ⁽¹⁾⁽³⁾	8,968	8,269	8,077
Income before income tax expense	2,999	2,899	2,120
Income tax expense (benefit)	400	722	(22)
Net income from non-controlling interest	—	—	1
Net income	\$2,599	\$2,177	\$2,143
Adjustments to net income:			
Dividends on preferred stock ⁽⁴⁾	\$(188)	\$(182)	\$(173)
Earnings allocated to participating securities ⁽⁵⁾	(1)	(2)	(2)
Net income available to common shareholders	\$2,410	\$1,993	\$1,968
Earnings per common share:			

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Basic	\$6.48	\$5.32	\$5.03
Diluted	6.40	5.24	4.97
Average common shares outstanding (in thousands):			
Basic	371,983	374,793	391,485
Diluted	376,476	380,213	396,090
Cash dividends declared per common share	\$1.78	\$1.60	\$1.44
Return on average common equity	12.2	% 10.6	% 10.5

(1) The new revenue recognition standard contributed approximately \$272 million in total revenue and total expenses for 2018, compared to 2017, including approximately \$190 million in management fees, \$58 million in foreign exchange trading services and \$24 million across other revenue lines, and expenses contributed approximately \$183 million in other expenses, \$59 million in transaction processing and \$30 million across other expense line items.

(2) Approximately \$15 million of swap costs in 1Q18 were reclassified from processing fees and other revenue within fee revenue to net interest income to conform to current presentation.

(3) Charles River Development contributed approximately \$121 million and \$57 million in total revenue and total expenses, respectively, in the fourth quarter of 2018, including approximately \$116 million in processing fees and other revenue and \$5 million in other revenue lines, and expenses contributed approximately \$28 million in compensation and employee benefits, \$18 million in amortization of other intangible assets and \$11 million in other expense lines.

(4) Additional information about our preferred stock dividends is provided in Note 15 to the consolidated financial statements in this Form 10-K.

(5) Represents the portion of net income available to common equity allocated to participating securities, composed of unvested and fully vested SERP shares and fully vested deferred director stock awards, which are equity-based awards that contain non-forfeitable rights to dividends, and are considered to participate with the common stock in undistributed earnings.

The following “Financial Results and Highlights” section provides information related to significant events, as well as highlights of our consolidated financial results for the year ended December 31, 2018 presented in Table 1: Overview of Financial Results. More detailed information about our consolidated financial results, including comparisons of our financial results for the year ended December 31, 2018 to those for the year ended December 31, 2017, is provided under “Consolidated Results of Operations,” “Line of Business Information” and “Capital” which follows these sections, as well as in our consolidated financial statements in this Form 10-K. In this Management’s

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Discussion and Analysis, where we describe the effects of changes in foreign exchange rates, those effects are determined by applying applicable weighted average foreign exchange rates from the relevant 2017 period to the relevant 2018 period results.

Financial Results and Highlights

EPS of \$6.40 in 2018 increased 22% compared to \$5.24 in 2017. Both years include the impact of notable items. 2018 notable items included:

Repositioning charges of approximately \$300 million;

Legal and related expenses of approximately \$50 million; and

Acquisition and restructuring costs primarily related to Charles River Development of approximately \$24 million.

2017 notable items included:

One-time estimated net impact of \$270 million associated with the TCJA, including a one-time estimated tax expense of approximately \$250 million and a one-time reduction in revenue of approximately \$20 million; and

Acquisition and restructuring costs related to GEAM and Beacon of approximately \$266 million.

2018 revenues were impacted by unfavorable market conditions and fee compression. In light of challenging market and industry headwinds, we have launched a new expense program designed to reduce costs.

2018 ROE of 12.2% increased from 10.6% in 2017. Pre-tax margin of 25.0% in 2018 decreased from 26.0% in 2017.

Operating leverage was (1.2)% for 2018. Operating leverage represents the difference between the percentage change in total revenue and the percentage change in total expenses, in each case relative to the prior year period.

Fee operating leverage was (4.0)% for 2018. Fee operating leverage represents the difference between the percentage change in total fee revenue and the percentage change in total expenses, in each case relative to the prior year period.

The negative fee operating leverage is primarily due to higher expenses, in part due to the aforementioned notable items.

On October 1, 2018, we completed our acquisition of Charles River Development, a provider of investment management front office

tools and solutions, for an all cash purchase price of approximately \$2.6 billion. We funded the acquisition with a July 2018 issuance of common stock of approximately \$1.15 billion, a September 2018 issuance of preferred stock of approximately \$500 million and the suspension of approximately \$950 million of share repurchases in 2018.

Total revenues contributed by Charles River Development in the fourth quarter of 2018 were approximately \$121 million, including \$116 million in processing fees and other revenue and \$5 million in other revenue lines.

Total expenses contributed by Charles River Development in the fourth quarter of 2018 were approximately \$57 million, including \$28 million in compensation and employee benefits, \$18 million in amortization of other intangible assets and \$11 million in other expense lines.

We have resumed our common stock purchase program in the first quarter of 2019 and may repurchase up to \$600 million through June 30, 2019 under the 2018 Program.

Revenue

Total revenue and fee revenue increased 7% and 5%, respectively, in 2018 compared to 2017, primarily driven by higher management fees and foreign exchange trading services and, in the case of total revenue, higher NII, partially offset by lower securities finance revenue.

The new revenue recognition standard, effective January 1, 2018, contributed approximately \$272 million to total revenue in 2018 compared to 2017.

Charles River Development contributed approximately \$121 million to total revenue in 2018.

Servicing fee revenue increased 1% in 2018 compared to 2017, primarily due to market appreciation and net new business, largely offset by challenging industry conditions, including fee pressure.

- Management fee revenue increased 15%, or \$235 million, in 2018 compared to 2017, reflecting higher average global equity markets during 2018. The new revenue recognition standard contributed \$190 million to management fee revenue in 2018, compared to 2017.

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Securities finance revenue decreased 10% in 2018 compared to 2017, primarily due to certain balance sheet repositioning efforts in 2018.

Processing fees and other revenue increased 17% in 2018 compared to 2017, and reflects approximately \$116 million from Charles River Development in 2018.

NII increased 16% in 2018 compared to 2017, primarily due to higher U.S. interest rates and disciplined liability pricing, partially offset by a mix shift to HQLA. In 2018, we sold approximately \$26 billion of non-HQLA, of which a significant portion has been reinvested in HQLA.

Expenses

Total expenses increased 9% in 2018 compared to 2017, primarily due to repositioning charges taken in 2018, the adoption of the new revenue recognition standard in 2018 and higher technology costs, partially offset by net Beacon savings.

In 2018, we initiated a new expense savings program and expect to realize \$350 million in gross expense savings by the end of 2019. As part of that program, we recorded a repositioning charge in the fourth quarter of 2018 of approximately \$223 million, consisting of \$198 million of compensation and employee benefits expenses and \$25 million of occupancy expenses. Including a charge taken in the second quarter of 2018, total repositioning charges were \$300 million in 2018.

In 2018, we achieved approximately \$245 million of Beacon pre-tax year-over-year savings, net of Beacon investments.

Total expenses in 2018 include approximately \$272 million and \$57 million related to the adoption of the new revenue recognition standard and our acquisition of Charles River Development, respectively.

AUC/A and AUM

AUC/A decreased 5% in 2018 compared to 2017, primarily due to lower market levels. In 2018, newly announced asset servicing mandates totaled approximately \$1.9 trillion. Servicing assets remaining to be installed in future periods totaled approximately \$385 billion as of December 31, 2018.

- AUM decreased 10% in 2018 compared to 2017, primarily driven by weaker period end equity markets as well as institutional and cash outflows, partially offset by ETF net inflows.

Capital

We declared aggregate common stock dividends of \$1.78 per share, totaling \$665 million in 2018, compared to \$1.60 per share, totaling \$596 million in 2017, representing an increase of approximately 12% on a per share basis.

In the first quarter of 2018, we acquired 3.3 million shares of common stock at an average per share cost of \$105.31 and an aggregate cost of approximately \$350 million under our prior common stock purchase program (the 2017 Program) approved by our Board.

In connection with our acquisition of Charles River Development, we did not repurchase any common stock under the common stock purchase plan approved by our Board in June 2018 (the 2018 Program), nor did we repurchase any common stock under the 2017 Program in the quarter ended June 30, 2018. We have resumed our common stock purchase program in the first quarter of 2019 and may repurchase up to \$600 million through June 30, 2019 under the 2018 Program.

In July 2018, we completed a public offering of approximately 13.24 million shares of our common stock. The offering price was \$86.93 per share and net proceeds totaled approximately \$1.15 billion.

In September 2018, we issued 500,000 depositary shares each representing a 1/100th ownership interest in a share of our Fixed-to-Floating Rate Non-Cumulative Perpetual Preferred Stock, Series H, without par value per share, with a liquidation preference of \$100,000 per share (equivalent to \$1,000 per depositary share) and an initial dividend rate of 5.625% per annum. The net proceeds were approximately \$500 million.

Our standardized CET1 capital ratio decreased to 11.7% as of December 31, 2018 compared to 11.9% as of December 31, 2017, and Tier 1 leverage ratio decreased to 7.2% as of December 31, 2018 compared to 7.3% as of December 31, 2017. The decreases are primarily driven by higher deduction of goodwill of \$1.5 billion and intangible assets of \$1.0

billion as a result of our acquisition of Charles River Development, as well as the phase in of the intangible assets of \$0.3 billion (100% in 2018 compared to 80% in 2017).

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CONSOLIDATED RESULTS OF OPERATIONS

This section discusses our consolidated results of operations for 2018 compared to 2017, as well as 2017 compared to 2016, and should be read in conjunction with the consolidated financial statements and accompanying condensed notes to the consolidated financial statements in this Form 10-K.

Total Revenue

TABLE 2: TOTAL REVENUE

(Dollars in millions)	Years Ended December 31,			% Change		% Change	
	2018	2017	2016	2018 vs. 2017	2017 vs. 2016		
Fee revenue:							
Servicing fees	\$5,421	\$5,365	\$5,073	1 %	6 %		
Management fees ⁽¹⁾	1,851	1,616	1,292	15	25		
Foreign exchange trading services ⁽¹⁾	1,201	1,071	1,099	12	(3)		
Securities finance	543	606	562	(10)	8		
Processing fees and other ⁽²⁾	289	247	90	17	174		
Total fee revenue ⁽²⁾	9,305	8,905	8,116	5	10		
Net interest income:							
Interest income	3,662	2,908	2,512	26	16		
Interest expense	991	604	428	64	41		
Net interest income	2,671	2,304	2,084	16	11		
Gains (losses) related to investment securities, net	6	(39)	7	nm	nm		
Total revenue ⁽¹⁾⁽²⁾	\$11,982	\$11,170	\$10,207	7	9		

⁽¹⁾ The new revenue recognition standard contributed approximately \$272 million in total revenue for 2018, compared to 2017, including approximately \$190 million in management fees, \$58 million in foreign exchange trading services and \$24 million across other revenue lines.

⁽²⁾ Charles River Development contributed approximately \$121 million in total revenue for the fourth quarter of 2018, including approximately \$116 million in processing fees and other revenue and \$5 million in other revenue lines.

^{nm} Not meaningful

Fee Revenue

Table 2: Total Revenue, provides the breakout of fee revenue for the years ended December 31, 2018, 2017 and 2016. Servicing and management fees collectively made up approximately 78% of the total fee revenue in 2018, 2017 and 2016.

Servicing Fee Revenue

Generally, our servicing fee revenues are affected by several factors including changes in market valuations, client activity and asset flows, net new business and the manner in which we price our services. We provide a range of services to our clients, including core custody services, accounting, reporting and administration and middle office services, and the

nature and mix of services provided affects our servicing fees. The basis for fees will differ across regions and clients. In general, approximately 55% of our servicing fee revenues have been variable due to changes in asset valuations including changes in daily average valuations of AUC/A; another 15% of our servicing fees are impacted by the volume of activity in the funds we serve; and the remaining 30% of our servicing fees tend not to be variable in nature nor impacted by market fluctuations or values.

Changes in Market Valuations

Our servicing fee revenue is impacted by both our levels of and the geographic and product mix of our AUC/A. Increases or decreases in market valuations have a corresponding impact on the level of our AUC/A and servicing fee revenues, though the degree of impact will vary depending on asset types and classes and geography of assets held within our clients' portfolios.

Over the past five years, including the year ended December 31, 2018, we estimate that worldwide market valuations impacted our servicing fee revenues by approximately (2)% to 5% annually and approximately 2% in 2018. See Table 3: Daily, Month-End and Year-End Equity Indices for selected indices. While the specific indices presented are indicative of general market trends, the asset types and classes relevant to individual client portfolios can and do differ, and the performance of associated relevant indices and of client portfolios can therefore differ from the performance of the indices presented. In addition, our asset classifications may differ from those industry classifications presented.

We estimate, using relevant information as of December 31, 2018 and assuming that all other factors remain constant, that:

A 10% increase or decrease in worldwide equity valuations, on a weighted average basis, over the relevant periods for which our servicing fees are calculated, would result in a corresponding change in our total servicing fee revenues, on average and over time, of approximately 3%; and

A 10% increase or decrease in worldwide fixed income valuations, on a weighted average basis, over the relevant periods for which our servicing fees are calculated, would result in a corresponding change in our total servicing fee revenues, on average and over time, of approximately 1%.

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	Years Ended December 31,			Years Ended December 31,			Years Ended December 31,		
	2018	2017	% Change	2018	2017	% Change	2018	2017	% Change
	Daily Averages of Indices			Averages of Month-End Indices			Year-End Indices		
S&P 500®	2,746	2,449	12 %	2,738	2,465	11 %	2,507	2,674	(6)%
MSCI EAFE®	1,965	1,886	4	1,957	1,900	3	1,720	2,051	(16)
MSCI® Emerging Markets	1,093	1,028	6	1,090	1,036	5	966	1,158	(17)
HFRI Asset Weighted Composite®	NA	NA	NA	1,404	1,352	4	1,380	1,389	(1)
Barclays Capital Global Aggregate Bond Index	NA	NA	NA	NA	NA	NA	479	485	(1)

⁽¹⁾ The index names listed in the table are service marks of their respective owners.

NA Not applicable

Client Activity and Asset Flows

Client activity and asset flows are impacted by the number of transactions we execute on behalf of our clients, including FX settlements, equity and derivative trades and wire transfer activity, as well as actions by our clients to change the asset class in which their assets are invested based on their risk acceptance tolerance. Industry trends, such as client redemptions out of hedge funds, can also impact our servicing fee revenues.

Over the past five years, including the year ended December 31, 2018, we estimate that client activity and asset flows, together, impacted our servicing fee revenues by approximately (1%) to 2% annually and approximately 1% in 2018. See Table 4: Industry Asset Flows for selected asset flow information. While the asset flows presented are indicative of general market trends, the asset types and classes relevant to individual client portfolios can and do differ, and our flows may differ from those market trends. In addition, our asset classifications may differ from those industry classifications presented.

TABLE 4: INDUSTRY ASSET FLOWS

(In billions)	Years Ended December 31,	
	2018	2017
North America - ICI Market Data ⁽¹⁾⁽²⁾		
Long-Term Funds ⁽³⁾	\$(349.6)	\$66.8
Money Market	119.8	81.2
ETF	310.9	470.8
Total ICI Flows	\$81.1	\$618.8

Europe - Broadridge Market

Data⁽¹⁾⁽⁴⁾

Long-Term Funds ⁽³⁾	\$(52.1)	\$713.5
Money Market	12.4	75.7
Total Broadridge Flows	\$(39.7)	\$789.2

⁽¹⁾ Industry data is provided for illustrative purposes only and is not intended to reflect the Company's activity or its clients' activity.

(2) Source: Investment Company Institute. Investment Company Institute (ICI) data includes funds not registered under the Investment Company Act of 1940. Mutual fund data represents estimates of net new cash flow, which is new sales minus redemptions combined with net exchanges, while ETF data represents net issuance, which is gross issuance less gross redemptions. Data for mutual funds that invest primarily in other mutual funds and ETFs that invest primarily in other ETFs were excluded from the series. ICI classifies mutual funds and ETFs based on language in the fund prospectus.

(3) The long-term fund flows reported by ICI are composed of North America Market flows mainly in Equities, Hybrids and Fixed-Income Asset Classes. The long-term fund flows reported by Broadridge are composed of EMEA Market flows mainly in Equities, Fixed-Income and Multi Asset Classes.

(4) Source: © Copyright 2018, Broadridge Financial Solutions, Inc. Funds of funds have been excluded from Broadridge data (to avoid double counting). Therefore, a market total is the sum of all the investment categories excluding the three funds of funds categories (in-house, ex-house and hedge). ETFs are included in Broadridge's database on mutual funds, but this excludes exchange-traded commodity products that are not mutual funds.

Pricing

The industry in which we operate has historically faced pricing pressure, and our servicing fee revenues are also affected by such pressures today. On average, over the past 5 years, including the year ended December 31, 2018, we estimate that pricing pressure with respect to existing clients have impacted our servicing fees by approximately (2%) annually, with the impact ranging from (1%) to (4%) in any given year and during the year ended December 31, 2018, the impact was at the higher end of that range. Pricing concessions can be a part of a contract renegotiation with a client including terms that may benefit us, such as extending the terms of our relationship with the client, expanding the scope of services that we provide or reducing our dependency on manual processes through the standardization of the services we provide. The timing of the impact of additional revenue generated by such additional services, and the amount of revenue generated, may differ from the impact of pricing concessions on existing services due to the necessary time required to onboard those new services and the nature of those services. These same market pressures also impact the fees we negotiate when we win business from new clients.

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Net New Business

Over the past five years, including the year ended December 31, 2018, net new business, which includes business both won and lost, has affected our servicing fee revenues by approximately 2% on average with a range of 1% to 3% annually and approximately 1% in 2018. New business can include: custody; product and participant level accounting; daily valuation and administration; record-keeping; cash management; foreign exchange, brokerage and other trading services; securities finance; and other services. Revenues associated with new servicing mandates may vary based on the breadth of services provided, the time required to install the assets, and the types of assets installed.

Management Fee Revenue

Management fees generally are affected by changes in month-end valuations of AUM. Management fees for certain components of managed assets, such as ETFs, mutual funds and UCITS, are affected by daily average valuations of AUM. Management fee revenue is more sensitive to market valuations than servicing fee revenue, as a higher proportion of the underlying services provided, and the associated management fees earned, are dependent on equity and fixed-income security valuations. Additional factors, such as the relative mix of assets managed, may have a significant effect on our management fee revenue. While certain management fees are directly determined by the values of AUM and the investment strategies employed, management fees may reflect other factors, including performance fee arrangements, as well as our relationship pricing for clients.

Asset-based management fees for actively managed products are generally charged at a higher percentage of AUM than for passive products. Actively managed products may also include performance fee arrangements which are recorded when the fee is earned, based on predetermined benchmarks associated with the applicable account's performance.

In light of the above, we estimate, using relevant information as of December 31, 2018 and assuming that all other factors remain constant, including the impact of business won and lost and client flows, that:

A 10% increase or decrease in worldwide equity valuations, on a weighted average basis, over the relevant periods for which our management fees are calculated, would result in a corresponding change in our total management fee revenues, on average and over time, of approximately 5%; and

A 10% increase or decrease in worldwide fixed-income valuations, on a weighted average basis, over the relevant periods for which our management fees are calculated, would result in a corresponding change in our total management fee revenues, on average and over time, of approximately 4%.

Daily averages, month-end averages and year-end indices demonstrate worldwide changes in equity and debt markets that affect our management fee revenue. Year-end indices affect the values of AUM as of those dates. See Table 3: Daily, Month-End and Year-End Equity Indices for selected indices.

Additional information about fee revenue is provided under "Line of Business Information" included in this Management's Discussion and Analysis.

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Net Interest Income

See Table 2: Total Revenue, for the breakout of interest income and interest expense for the years ended December 31, 2018, 2017 and 2016. NII was \$2,671 million for 2018, compared to \$2,304 million and \$2,084 million for 2017 and 2016, respectively.

NII is defined as interest income earned on interest-earning assets less interest expense incurred on interest-bearing liabilities. Interest-earning assets, which principally consist of investment securities, interest-bearing deposits with banks, resale agreements, loans and leases and other liquid assets, are financed primarily by client deposits, short-term borrowings and long-term debt.

NIM represents the relationship between annualized fully taxable-equivalent NII and average total interest-earning assets for the period. It is calculated by dividing fully taxable-equivalent NII by average interest-earning assets. Revenue that is exempt from income taxes, mainly earned from certain investment securities (state and political subdivisions), is adjusted to a fully taxable-equivalent basis using the U.S. federal and state statutory income tax rates. See Table 5: Average Balances and Interest Rates - Fully Taxable-Equivalent Basis, for the breakout of NII on a FTE basis for the years ended December 31, 2018, 2017 and 2016. NII on a FTE basis increased in 2018 compared to 2017, primarily due to higher U.S. interest rates and a continued focus on disciplined liability pricing.

TABLE 5: AVERAGE BALANCES AND INTEREST RATES - FULLY TAXABLE-EQUIVALENT BASIS⁽¹⁾

	Years Ended December 31, 2018			2017			2016		
	Average Balance	Interest Revenue/ Expense	Rate	Average Balance	Interest Revenue/ Expense	Rate	Average Balance	Interest Revenue/ Expense	Rate
(Dollars in millions; fully taxable-equivalent basis)									
Interest-bearing deposits with banks	\$54,328	\$ 387	0.71 %	\$47,514	\$ 180	0.38 %	\$53,091	\$ 126	0.24 %
Securities purchased under resale agreements ⁽²⁾	2,901	335	11.55	2,131	264	12.38	2,558	146	5.70
Trading account assets	1,051	—	—	1,011	(1)	(0.12)	921	—	—
Investment securities	88,070	1,927	2.19	95,779	1,891	1.97	100,738	1,962	1.95
Loans and leases	23,573	698	2.96	21,916	519	2.37	19,013	384	2.02
Other interest-earning assets	15,714	372	2.37	22,884	222	0.97	22,863	61	0.27
Average total interest-earning assets	\$ 185,637	\$ 3,719	2.00	\$ 191,235	\$ 3,075	1.61	\$ 199,184	\$ 2,679	1.34
Interest-bearing deposits:									
U.S.	\$54,953	\$ 256	0.47 %	\$30,623	\$ 96	0.31 %	\$30,107	\$ 132	0.44 %
Non-U.S. ⁽³⁾	70,623	107	0.15	91,937	67	0.07	95,551	(47)	(0.05)
Total interest-bearing deposits ⁽³⁾⁽⁴⁾	125,576	363	0.29	122,560	163	0.13	125,658	85	0.07
Securities sold under repurchase agreements	2,048	13	0.62	3,683	2	0.05	4,113	1	0.02
Federal funds purchased	—	—	—	—	—	—	31	—	—
Other short-term borrowings	1,327	17	1.28	1,313	10	0.80	1,666	7	0.40
Long-term debt	10,686	389	3.64	11,595	308	2.66	11,401	260	2.29
Other interest-bearing liabilities	4,956	209	4.20	4,607	121	2.63	5,394	75	1.39
Average total interest-bearing liabilities	\$ 144,593	\$ 991	0.68	\$ 143,758	\$ 604	0.42	\$ 148,263	\$ 428	0.29

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Interest rate spread	1.32 %	1.19 %	1.05 %
Net interest income-fully taxable-equivalent basis	\$ 2,728	\$ 2,471	\$ 2,251
Net interest margin-fully taxable-equivalent basis	1.47 %	1.29 %	1.13 %
Tax-equivalent adjustment	(57)	(167)	(167)
Net interest income-GAAP basis	\$ 2,671	\$ 2,304	\$ 2,084

(1) Rates earned/paid on interest-earning assets and interest-bearing liabilities include the impact of hedge activities associated with our asset and liability management activities where applicable.

(2) Reflects the impact of balance sheet netting under enforceable netting agreements of approximately \$36 billion, \$31 billion and \$30 billion for the years ended December 31, 2018, 2017 and 2016, respectively. Excluding the impact of netting, the average interest rates would be approximately 0.87%, 0.79% and 0.43% for the years ended December 31, 2018, 2017 and 2016, respectively.

(3) Average rate includes the impact of FX swap costs of approximately \$106 million, \$141 million and \$27 million for the years ended December 31, 2018, 2017 and 2016, respectively. Average rates for total interest-bearing deposits excluding the impact of FX swap costs were 0.20%, 0.02% and 0.04% for the years ended December 31, 2018, 2017 and 2016, respectively.

(4) Total deposits averaged \$161.4 billion for 2018, compared to \$163.8 billion and \$170.5 billion for 2017 and 2016, respectively.

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Changes in the components of interest-earning assets and interest-bearing liabilities are discussed in more detail below. Additional information about the components of interest income and interest expense is provided in Note 17 to the consolidated financial statements in this Form 10-K.

Average total interest-earning assets were \$185.64 billion in 2018 compared to \$191.24 billion in 2017. The decrease is largely driven by lower client deposits, which includes both interest-bearing and non-interest-bearing deposits and securities sold under repurchase agreements.

Interest-bearing deposits with banks averaged \$54.33 billion in 2018 compared to \$47.51 billion in 2017. These deposits primarily reflect our maintenance of cash balances at the Federal Reserve, the ECB and other non-U.S. central banks.

Securities purchased under resale agreements averaged \$2.90 billion in 2018 compared to \$2.13 billion in 2017. This reflects the impact of balance sheet netting under enforceable netting agreements of approximately \$36 billion and \$31 billion for 2018 and 2017, respectively. We maintain an agreement with the Fixed Income Clearing Corporation (FICC), a clearing organization that enables us to net all securities sold under repurchase agreements against those purchased under resale agreements with counterparties that are also members of the clearing organization. The increase in 2018 compared to 2017 is primarily due to the expansion of our program with the FICC and new client activity.

Investment securities averaged \$88.07 billion in 2018 compared to \$95.78 billion in 2017. The decrease in average investment securities was primarily driven by our investment repositioning strategy to prioritize capital efficient client lending while managing OCI sensitivity. We sold approximately \$26 billion of securities, primarily non-HQLA, during 2018, with a significant portion of the proceeds being reinvested in HQLA, such as MBS and interest-bearing deposits with banks.

Loans and leases averaged \$23.57 billion in 2018 compared to \$21.92 billion in 2017. The increase in average loans and leases was primarily driven by higher levels of mutual fund lending and commercial real estate loans, as part of our effort to expand our commercial and real estate loan program. Loans and leases also includes U.S. and non-U.S. overdrafts, which provide liquidity to clients in support of investment activities.

Average other interest-earning assets, largely associated with our enhanced custody business, decreased to \$15.71 billion in 2018 from \$22.88 billion in 2017, primarily driven by a reduction in the level of cash collateral posted. Enhanced custody is our securities financing business where we act as principal with respect to our custody clients and generate

securities finance revenue. The NII earned on these transactions is generally lower than the interest earned on other alternative investments.

Aggregate average U.S. and non-U.S. interest-bearing deposits increased to \$125.58 billion in 2018 from \$122.56 billion in 2017. The increase was primarily driven by a gradual shift from non-interest-bearing deposits to interest-bearing deposits. Future deposit levels will be influenced by the underlying asset servicing business, client deposit behavior and market conditions, including the general levels of U.S. and non-U.S. interest rates.

Average other short-term borrowings, largely associated with our tax-exempt investment program, increased to \$1.33 billion in 2018 from \$1.31 billion in 2017.

Average long-term debt was \$10.69 billion in 2018 compared to \$11.60 billion in 2017. These amounts reflect issuances and maturities of senior debt during the respective periods, including the issuance of \$1.0 billion of senior debt in December 2018.

Average other interest-bearing liabilities were \$4.96 billion in 2018 compared to \$4.61 billion in 2017. Other interest-bearing liabilities primarily reflect our level of cash collateral received from clients in connection with our enhanced custody business, which is presented on a net basis where we have enforceable netting agreements. Several factors could affect future levels of NII and NIM, including the volume and mix of client deposits and funding sources; central bank actions; balance sheet management activities; changes in the level and slope of U.S. and non-U.S. interest rates; revised or proposed regulatory capital or liquidity standards, or interpretations of those

standards; the yields earned on securities purchased compared to the yields earned on securities sold or matured and changes in the type and amount of credit or other loans we extend.

Based on market conditions and other factors, including regulatory standards, we continue to reinvest the majority of the proceeds from pay-downs and maturities of investment securities in highly-rated U.S. and non-U.S. securities, such as U.S. Treasury and agency securities, sovereign debt securities and federal agency MBS. The pace at which we reinvest and the types of investment securities purchased will depend on the impact of market conditions, the implementation of regulatory standards, including interpretation of those standards and other factors over time. We expect these factors and the levels of global interest rates to impact our reinvestment program and future levels of NII and NIM.

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Provision for Loan Losses

We recorded a provision for loan losses of \$15 million in 2018 compared to \$2 million and \$10 million in 2017 and 2016, respectively. The provision increased in 2018 compared to 2017, primarily due to a higher volume of loans to non-investment grade borrowers composed of senior secured loans that we purchased in connection with our participation in loan syndications in the non-investment grade lending market. Additional information about these senior secured loans is provided under "Loans and Leases" in "Financial Condition" in this Management's Discussion and Analysis and in Note 4 to the consolidated financial statements in this Form 10-K.

Expenses

Table 6: Expenses, provides the breakout of expenses for the years ended December 31, 2018, 2017 and 2016.

TABLE 6: EXPENSES

(Dollars in millions)	Years Ended December 31,			%	%
	2018	2017	2016	Change 2018 vs. 2017	Change 2017 vs. 2016
Compensation and employee benefits ⁽¹⁾	\$4,780	\$4,394	\$4,353	9	1
Information systems and communications	1,324	1,167	1,105	14	6
Transaction processing services ⁽²⁾	938	838	800	12	5
Occupancy	500	461	440	9	5
Acquisition costs	31	21	69	48	(70)
Restructuring charges, net	(7)	245	140	nm	75
Amortization of other intangible assets ⁽¹⁾	226	214	207	6	3
Other:					
Professional services	357	340	379	5	(10)
Regulatory fees and assessments	87	106	82	(18)	29
Other ⁽²⁾	732	483	502	52	(4)
Total other ⁽²⁾	1,176	929	963	27	(4)
Total expenses ^{(1) (2)}	\$8,968	\$8,269	\$8,077	9	2
Number of employees at year-end	40,142	36,643	33,783	10	8

⁽¹⁾ Charles River Development contributed approximately \$57 million in total expenses for the fourth quarter of 2018, including approximately \$28 million in compensation and employee benefits, \$18 million in amortization of other intangible assets and \$11 million in other expense lines.

⁽²⁾ The new revenue recognition standard contributed approximately \$272 million in total expenses for 2018, compared to 2017, including approximately \$183 million in other expenses, \$59 million in transaction processing and \$30 million across other expense line items.

^{nm} Not meaningful

Compensation and employee benefits expenses increased 9% in 2018 compared to 2017, primarily due to repositioning charges of \$259 million in 2018, or two-thirds of the 9% increase, as described below, as well as annual merit increases, higher investments to support new business and approximately \$28 million from Charles River Development, partially offset by net Beacon savings and lower performance based incentive compensation.

Compensation and employee benefits expenses increased 1% in 2017, compared to 2016, primarily due to increased costs to support new business, annual merit and performance based incentive compensation increases, partially offset by net Beacon savings. In December 2016, we recorded a pre-tax charge of \$249 million (\$161 million after tax) associated with an amendment of the terms of outstanding, previously issued, deferred cash-settled incentive compensation awards for certain employees to remove continued service requirements, thereby accelerating the future

expense that would have been recognized over the remaining term of the awards had the continued service requirement not been removed.

Headcount increased 10% in 2018 compared to 2017, primarily driven by growth in our low cost locations and our acquisition of Charles River Development. Headcount in high cost locations fell in 2018 compared to 2017, primarily due to reductions from Beacon, partially offset by increases resulting from the Charles River Development acquisition.

Information systems and communications expenses increased 14% in 2018 compared to 2017, and 6% in 2017 compared to 2016. Both increases were primarily related to technology infrastructure enhancements as well as additional investments to support growth, regulatory initiatives and Beacon-related investments.

Transaction processing services expenses increased 12% in 2018 compared to 2017, reflecting the adoption of the new revenue recognition standard and higher client volumes. Transaction processing services expenses increased 5% in 2017 compared to 2016, primarily related to higher client volumes.

Occupancy expenses increased 9% in 2018 compared to 2017, primarily due to repositioning charges of approximately \$41 million in 2018, partially offset by net Beacon savings. Occupancy expenses increased 5% in 2017 compared to 2016, primarily due to the GEAM acquisition and higher investments to support new business.

Amortization of other intangible assets increased 6% in 2018 compared to 2017, primarily due to contributions from Charles River Development of approximately \$18 million and accelerated amortization associated with a business exit of approximately \$16 million. Amortization of other intangible assets increased 3% in 2017 compared to 2016, primarily due to GEAM intangible asset amortization.

Other expenses increased 27% in 2018, compared to 2017, reflecting the adoption of the new revenue recognition standard which contributed approximately \$183 million as well as higher legal and related expenses, partially offset by net Beacon savings. Other expenses decreased 4% in 2017

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compared to 2016, primarily due to lower professional services costs.

As a systemically important financial institution, we are subject to enhanced supervision and prudential standards. Our status as a G-SIB has also resulted in heightened prudential and conduct expectations of our U.S. and international regulators with respect to our capital and liquidity management and our compliance and risk oversight programs. These heightened expectations have increased our regulatory compliance costs, including personnel, technology and systems, as well as significant additional implementation and related costs to enhance our regulatory compliance programs. Regulatory compliance requirements are anticipated to remain at least at the elevated levels we have experienced over the past several years.

Acquisition Costs

We recorded approximately \$31 million of acquisition costs in 2018 related to our acquisition of Charles River Development on October 1, 2018. In 2017, we recorded approximately \$21 million of acquisition costs primarily related to our acquisition of the GEAM business on July 1, 2016. As we integrate Charles River Development into our business, we expect to incur a total of approximately \$200 million, including the \$31 million in 2018, of acquisition costs, including merger and integration costs, through 2021. For further information on our acquisition of Charles River Development, refer to Note 1 to the consolidated financial statements in this Form 10-K.

Restructuring and Repositioning Charges**Repositioning Charges**

In 2018, we initiated a new expense program to accelerate efforts to become a higher-performing organization and help navigate challenging market and industry conditions. Through increased resource discipline, process re-engineering and automation, we expect to realize \$350 million in gross expense savings in 2019, consisting primarily of compensation and benefits expenses savings. As part of that program, expenses for 2018 included a repositioning charge of \$300 million, including \$259 million of compensation and employee benefits and \$41 million of occupancy costs.

Beacon

In 2018, we released \$7 million of restructuring accruals related to Beacon. In 2017, we recorded restructuring charges of \$245 million primarily related to Beacon. In aggregate, we have recorded restructuring charges of approximately \$380 million related to Beacon, including \$293 million in severance costs and \$87 million in real estate actions, information technology application rationalization and other restructuring.

The following table presents aggregate activity for the periods indicated.

TABLE 7: RESTRUCTURING AND REPOSITIONING CHARGES

(In millions)	Employee Related Costs	Real Estate Actions	Asset and Other Write-offs	Total
Accrual Balance at December 31, 2015	\$ 9	\$ 11	\$ 3	\$23
Accruals for Business Operations and Information Technology	(2)	—	—	(2)
Accruals for Beacon	94	18	30	142
Payments and other adjustments	(64)	(12)	(31)	(107)
Accrual Balance at December 31, 2016	\$ 37	\$ 17	\$ 2	\$56
Accruals for Beacon	186	32	27	245
Payments and Other Adjustments	(57)	(17)	(26)	(100)
Accrual Balance at December 31, 2017	\$ 166	\$ 32	\$ 3	\$201
Accruals for Beacon	(7)	—	—	(7)
Accruals for Repositioning Charges	259	41	—	300
Payments and Other Adjustments	(115)	(36)	(2)	(153)
Accrual Balance at December 31, 2018	\$ 303	\$ 37	\$ 1	\$341
Income Tax Expense				

Income tax expense (benefit) was \$400 million in 2018, compared to \$722 million and \$(22) million in 2017 and 2016, respectively. Our effective tax rate for 2018 was 13.3%, compared to 24.9% and (1.0)% in 2017 and 2016, respectively. The 2018 income tax expense included an additional deferred tax benefit of \$32 million related to adjustments from the TCJA provisional estimate recorded in 2017. The 2017 income tax expense included a one-time estimated tax expense of \$250 million for the provisional impact of the enactment of the TCJA. The 2016 benefit included a reduction in accrued tax expense attributable to retained foreign earnings and tax benefits from capital actions involving our overseas affiliates.

Additional information regarding income tax expense, including unrecognized tax benefits, and tax contingencies are provided in Notes 13 and 22 to the consolidated financial statements in this Form 10-K.

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LINE OF BUSINESS INFORMATION

Our operations are organized into two lines of business: Investment Servicing and Investment Management, which are defined based on products and services provided. The results of operations for these lines of business are not necessarily comparable with those of other companies, including companies in the financial services industry.

Investment Servicing provides services for institutional clients, including mutual funds, collective investment funds and other investment pools, corporate and public retirement plans, insurance companies, investment managers, foundations and endowments worldwide. Products include: custody; product- and participant-level accounting; daily pricing and administration; master trust and master custody; record-keeping; cash management; foreign exchange, brokerage and other trading services; securities finance; our enhanced custody product, which integrates principal securities lending and custody; deposit and short-term investment facilities; loans and lease financing; investment manager and alternative investment manager operations outsourcing; and performance, risk and compliance analytics to support institutional investors. New products and services resulting from our acquisition of Charles River Development on October 1, 2018 include: portfolio modeling and construction; trade order management; investment risk and compliance; and wealth management solutions.

Investment Management, through State Street Global Advisors, provides a broad range of investment management strategies and products for our clients. Our investment management strategies and products span the risk/reward spectrum, including core and enhanced indexing, multi-asset strategies, active quantitative and fundamental active capabilities and alternative investment strategies. Our AUM is currently primarily weighted to indexed strategies. In addition, we provide a breadth of services and solutions, including environmental, social and governance investing, defined benefit and defined contribution and OCIO. State Street Global Advisors is also a provider of ETFs, including the SPDR® ETF brand. While management fees are primarily determined by the values of AUM and the investment strategies employed, management fees reflect other factors as well, including the benchmarks specified in the respective management agreements related to performance fees.

For information about our two lines of business, as well as the revenues, expenses and capital allocation methodologies associated with them, refer to Note 24 to the consolidated financial statements in this Form 10-K.

Investment Servicing

TABLE 8: INVESTMENT SERVICING LINE OF BUSINESS RESULTS

(Dollars in millions, except where otherwise noted)	Years Ended December 31,			% Change	
	2018	2017	2016	2018 vs. 2017	2017 vs. 2016
Servicing fees	\$5,429	\$5,365	\$5,073	1 %	6 %
Foreign exchange trading services	1,071	999	1,038	7	(4)
Securities finance	543	606	562	(10)	8
Processing fees and other ⁽¹⁾	294	240	119	23	102
Total fee revenue ⁽¹⁾	7,337	7,210	6,792	2	6
Net interest income	2,691	2,309	2,081	17	11
Gains (losses) related to investment securities, net	6	(39)	7	nm	nm
Total revenue ⁽¹⁾	10,034	9,480	8,880	6	7
Provision for loan losses	15	2	10	650	(80)
Total expenses	7,034	6,717	6,660	5	1
Income before income tax expense	\$2,985	\$2,761	\$2,210	8	25
Pre-tax margin	30 %	29 %	25 %		
Average assets (in billions)	\$220.2	\$214.0	\$225.3		

⁽¹⁾ Charles River Development contributed approximately \$121 million and \$57 million in total revenue and total expenses, respectively, for the fourth quarter of 2018, including approximately \$116 million in processing fees and other and \$5 million across other revenue lines, and expenses contributed approximately \$28 million in compensation and employee benefits, \$18 million in amortization of other intangible assets and \$11 million in other expense lines.

^{nm} Not meaningful

Servicing Fees

Servicing fees increased 1% in 2018 compared to 2017, primarily due to market appreciation and net new business, largely offset by challenging industry conditions, including fee pressure.

Servicing fees increased 6% in 2017 compared to 2016, primarily due to market appreciation and net new business, partially offset by continued hedge fund outflows and the impact of the businesses we exited in 2017. Servicing fees in 2016 included a revenue reduction of \$48 million from reimbursements related to the manner in which we invoiced certain expenses to our clients.

Servicing fees generated outside the U.S. were approximately 47% of total servicing fees in 2018 compared to approximately 45% and 42% in 2017 and 2016, respectively.

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TABLE 9: ASSETS UNDER CUSTODY AND/OR ADMINISTRATION BY PRODUCT

(In billions)	As of December 31,			%	%
	2018	2017	2016	Change	Change
				2018 vs. 2017	vs. 2016
Collective funds	8,999	9,707	7,501	(7)	29
Insurance and other products	8,220	9,105	8,845	(10)	3
Mutual funds	\$7,912	\$7,603	\$6,841	4 %	11 %
Pension products	6,489	6,704	5,584	(3)	20
Total	\$31,620	\$33,119	\$28,771	(5)	15

TABLE 10: ASSETS UNDER CUSTODY AND/OR ADMINISTRATION BY ASSET CLASS

(In billions)	As of December 31,			%	%
	2018	2017	2016	Change	Change
				2018 vs. 2017	vs. 2016
Equities	\$18,041	\$19,214	\$16,189	(6)%	19 %
Fixed-income	9,758	10,070	9,231	(3)	9
Short-term and other investments	3,821	3,835	3,351	—	14
Total	\$31,620	\$33,119	\$28,771	(5)	15

TABLE 11: ASSETS UNDER CUSTODY AND/OR ADMINISTRATION BY GEOGRAPHY⁽¹⁾

(In billions)	As of December 31,			%	%
	2018	2017	2016	Change	Change
				2018 vs. 2017	vs. 2016
Americas	\$23,203	\$24,418	\$21,544	(5)%	13 %
Europe/Middle East/Africa	6,699	7,028	5,734	(5)	23
Asia/Pacific	1,718	1,673	1,493	3	12
Total	\$31,620	\$33,119	\$28,771	(5)	15

⁽¹⁾ Geographic mix is generally based on the domicile of the entity servicing the funds and is not necessarily representative of the underlying asset mix.

Asset servicing mandates newly announced in 2018 totaled approximately \$1.9 trillion, which includes a small number of large client mandates announced in the first quarter of 2018. Servicing assets remaining to be installed in future periods totaled approximately \$385 billion as of December 31, 2018, which will be reflected in AUC/A in future periods after installation and will generate servicing fee revenue in subsequent periods. The full revenue impact of such mandates will be realized over several quarters as the assets are installed and additional services are added over that period.

New asset servicing mandates and servicing assets remaining to be installed in future periods exclude certain new business which has been contracted, but for which the client has not yet provided permission to publicly disclose and the expected installation date extends beyond one quarter. These excluded assets, which from time to time may be significant, will be included in new asset servicing mandates and reflected in servicing assets remaining to be installed in the period in which the client provides its permission. Servicing mandates and servicing assets remaining to be installed in future periods are presented on a gross basis and therefore also do not include the impact of clients who have notified us during the period of their intent to terminate or reduce their relationship with us, which may from

time to time be significant.

With respect to these new servicing mandates, once installed we may provide various services, including, accounting, bank loan servicing, compliance reporting and monitoring, custody, depository banking services, foreign exchange, fund administration, hedge fund servicing, middle office outsourcing, performance and analytics, private equity administration, real estate administration, securities finance, transfer agency and wealth management services. Revenues associated with new servicing mandates may vary based on the breadth of services provided and the timing of installation, and the types of assets.

For additional information about the impact of worldwide equity and fixed-income valuations on our fee revenue, as well as other key drivers of our servicing fee revenue, refer to "Fee Revenue" in "Consolidated Results of Operations" included in this Management's Discussion and Analysis.

As a result of a decision to diversify providers, one of our large clients has moved a portion of its assets, largely common trust funds, to another service provider. We remain a significant service provider to this client. The transition, which began in 2018 and is largely complete, represents approximately \$1 trillion in assets with respect to which we no longer derive revenue post-transition.

Foreign Exchange Trading Services

Foreign exchange trading services revenue, as presented in Table 8: Investment Servicing Line of Business Results, increased 7% in 2018 compared to

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2017, primarily due to higher FX client volumes and volatility. Foreign exchange trading services is composed of revenue generated by FX trading, as well as revenue generated by brokerage and other trading services. FX trading and brokerage and other trading services represented approximately 60% and 40%, respectively, of our total foreign exchange trading services revenue in both 2018 and 2017.

We primarily earn FX trading revenue by acting as a principal market-maker through both "direct sales and trading" and "indirect foreign exchange trading."

Direct sales and trading: Represent FX transactions at negotiated rates with clients and investment managers that contact our trading desk directly. These principal market-making activities include transactions for funds serviced by third party custodians or prime brokers, as well as those funds under custody with us.

Indirect FX trading: Represent FX transactions with clients or their investment managers routed to our FX desk through our asset-servicing operation, and to all of which, we are the funds' custodian. We execute indirect FX trades as a principal at rates disclosed to our clients.

Our FX trading revenue is influenced by multiple factors, including: the volume and type of client FX transactions and related spreads; currency volatility, reflecting market conditions; and our management of exchange rate, interest rate and other market risks associated with our foreign exchange activities. The relative impact of these factors on our total FX trading revenues often differs from period to period. For example, assuming all other factors remain constant, increases or decreases in volumes or bid-offer spreads across product mix tend to result in increases or decreases, as the case may be, in client-related FX revenue.

Our clients that utilize indirect FX trading can, in addition to executing their FX transactions through dealers not affiliated with us, transition from indirect FX trading to either direct sales and trading execution, including our "Street FX" service, or to one of our electronic trading platforms. Street FX, in which we continue to act as a principal market-maker, enables our clients to define their FX execution strategy and automate the FX trade execution process, both for funds under custody with us as well as those under custody at another bank.

We also earn foreign exchange trading services revenue through "electronic FX services" and "other trading, transition management and brokerage revenue."

Electronic FX services: Our clients may choose to execute FX transactions through one of our

electronic trading platforms. These transactions generate revenue through a "click" fee.

Other trading, transition management and brokerage revenue: As our clients look to us to enhance and preserve portfolio values, they may choose to utilize our Transition or Currency Management capabilities or transact with our Equity Trade execution group. These transactions generate revenue via commissions charged for trades transacted during the management of these portfolios.

Our transition management revenue has been adversely affected by compliance issues in our U.K. business during 2010 and 2011, including settlements with the U.K. FCA in 2014 and the DOJ and SEC in 2017, including a deferred prosecution agreement. The reputational and regulatory impact of those compliance issues continues and may continue to adversely affect our results in future periods.

Securities Finance

Our securities finance business consists of three components:

- (1) an agency lending program for State Street Global Advisors managed investment funds with a broad range of investment objectives, which we refer to as the State Street Global Advisors lending funds;
 - (2) an agency lending program for third-party investment managers and asset owners, which we refer to as the agency lending funds; and
 - (3) security lending transactions which we enter into as principal, which we refer to as our enhanced custody business.
- Securities finance revenue earned from our agency lending activities, which is composed of our split of both the spreads related to cash collateral and the fees related to non-cash collateral, is principally a function of the volume of securities on loan, the interest rate spreads and fees earned on the underlying collateral and our share of the fee split.

As principal, our enhanced custody business borrows securities from the lending client or other market participants and then lends such securities to the subsequent borrower, either our client or a broker/dealer. We act as principal when the lending client is unable to, or elects not to, transact directly with the market and execute the transaction and furnish the securities. In our role as principal, we provide support to the transaction through our credit rating. While we source a significant proportion of the securities furnished by us in our role as principal from third parties, we have the ability to source securities through assets under custody from clients who have designated us as an eligible borrower.

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Securities finance revenue, as presented in Table 8: Investment Servicing Line of Business Results, decreased 10% in 2018 compared to 2017, primarily due to certain balance sheet repositioning efforts within our enhanced custody business. Securities finance revenue increased 8% in 2017 compared to 2016, primarily as a result of higher revenue in our enhanced custody business.

Market influences may continue to affect client demand for securities finance, and as a result our revenue from, and the profitability of, our securities lending activities in future periods. In addition, the constantly evolving regulatory environment, including revised or proposed capital and liquidity standards, interpretations of those standards, and our own balance sheet management activities, may influence modifications to the way in which we deliver our agency lending or enhanced custody businesses, the volume of our securities lending activity and related revenue and profitability in future periods.

Processing Fees and Other

Processing fees and other revenue includes diverse types of fees and revenue, including fees from our structured products business, fees from software licensing and maintenance, equity income from our joint venture investments, gains and losses on sales of other assets and amortization of our tax-advantaged investments.

Processing fees and other revenue, presented in Table 8: Investment Servicing Line of Business Results, increased 23% in 2018 compared to 2017, and reflects approximately \$116 million from Charles River Development in 2018. Processing fees and other revenue increased 102% in 2017 compared to 2016, primarily due to pre-tax gains in 2017 from the disposition of certain joint venture interests and the sale of an equity trading platform.

Expenses

Total expenses for Investment Servicing increased 5% in 2018 compared to 2017, primarily due to higher technology costs, higher investments to support new business, annual merit increases and \$57 million of expenses from Charles River Development, partially offset by net Beacon savings and lower performance based incentive compensation. Additional information about expenses is provided under "Expenses" in "Consolidated Results of Operations" included in this Management's Discussion and Analysis.

Investment Management

TABLE 12: INVESTMENT MANAGEMENT LINE OF BUSINESS RESULTS

(Dollars in millions, except where otherwise noted)	Years Ended December 31,			%	%
	2018	2017	2016	Change 2018 vs. 2017	Change 2017 vs. 2016
Management fees ⁽¹⁾	\$1,851	\$1,616	\$1,292	15 %	25 %
Foreign exchange trading services ⁽¹⁾⁽²⁾	130	72	61	81	18
Processing fees and other	(5)	7	(29)	(171)	(124)
Total fee revenue	1,976	1,695	1,324	17	28
Net interest income	(20)	(5)	3	nm	nm
Total revenue	1,956	1,690	1,327	16	27
Total expenses ⁽¹⁾	1,544	1,286	1,218	20	6
Income before income tax expense	\$412	\$404	\$109	2	271
Pre-tax margin	21 %	24 %	8 %		
Average assets (in billions)	\$3.2	\$5.4	\$4.4		

⁽¹⁾ The new revenue recognition standard contributed approximately \$248 million in Investment Management total revenue, including approximately \$190 million in management fees and \$58 million in foreign exchange trading services, and \$248 million in Investment Management total expenses for 2018 compared to 2017.

(2) Includes revenues from distributing and marketing activities for US mutual funds and ETFs associated with State Street Global Advisors.

^{nm} Not meaningful

Management Fees

Management fees increased 15%, or \$235 million, in 2018 compared to 2017, reflecting higher average global equity markets during 2018. The new revenue recognition standard contributed approximately \$190 million to management fee revenue in 2018 compared to 2017.

Management fees increased 25% in 2017 compared to 2016, primarily due to the full year of the acquired GEAM business in 2017 compared to a half year in 2016, higher global equity markets and higher revenue yielding ETF inflows.

Management fees generated outside the U.S. were approximately 27% of total management fees in 2018, compared to approximately 28% and 32% in 2017 and 2016, respectively.

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CLASS AND INVESTMENT APPROACH

(In billions)	As of December 31,			%	%
	2018	2017	2016	Change 2018 vs. 2017	Change 2017 vs. 2016
Equity:					
Active	\$80	\$95	\$73	(16)%	30 %
Passive	1,464	1,650	1,401	(11)	18
Total Equity	1,544	1,745	1,474	(12)	18
Fixed-Income:					
Active	81	77	70	5	10
Passive	341	337	308	1	9
Total Fixed-Income	422	414	378	2	10
Cash ⁽¹⁾	287	330	333	(13)	(1)
Multi-Asset-Class Solutions:					
Active	19	18	19	6	(5)
Passive	113	129	107	(12)	21
Total Multi-Asset-Class Solutions	132	147	126	(10)	17
Alternative Investments ⁽²⁾ :					
Active	21	23	28	(9)	(18)
Passive	105	123	129	(15)	(5)
Total Alternative Investments	126	146	157	(14)	(7)
Total	\$2,511	\$2,782	\$2,468	(10)	13

(1) Includes both floating- and constant-net-asset-value portfolios held in commingled structures or separate accounts.

(2) Includes real estate investment trusts, currency and commodities, including SPDR[®] Gold Shares ETF and SPDR[®] Long Dollar Gold Trust ETF. We are not the investment manager for the SPDR[®] Gold Shares ETF and SPDR[®] Long Dollar Gold Trust ETF, but act as the marketing agent.

TABLE 14: EXCHANGE - TRADED FUNDS
BY ASSET CLASS⁽¹⁾

(In billions)	As of December			%	%
	31, 2018	31, 2017	31, 2016	Change 2018 vs. 2017	Change 2017 vs. 2016
Alternative Investments ⁽²⁾	\$43	\$48	\$42	(10)%	14 %
Cash	9	2	2	350	—
Equity	482	531	426	(9)	25
Fixed-income	66	63	51	5	24
Total Exchange-Traded Funds	\$600	\$644	\$521	(7)	24

(1) ETFs are a component of AUM presented in the preceding table.

(2) Includes real estate investment trusts, currency and commodities, including SPDR[®] Gold Shares ETF and SPDR[®] Long Dollar Gold Trust ETF. We are not the investment manager for the SPDR[®] Gold Shares ETF and SPDR[®] Long Dollar Gold Trust ETF, but act as the marketing agent.

TABLE 15: GEOGRAPHIC MIX OF ASSETS
UNDER MANAGEMENT⁽¹⁾

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(In billions)	As of December 31,			%	%
	2018	2017	2016	Change 2018 vs. 2017	Change 2017 vs. 2016
North America	\$1,731	\$1,931	\$1,691	(10)%	14 %
Europe/Middle East/Africa	421	521	482	(19)	8
Asia/Pacific	359	330	295	9	12
Total	\$2,511	\$2,782	\$2,468	(10)	13

⁽¹⁾ Geographic mix is based on client location or fund management location.

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TABLE 16: ACTIVITY IN ASSETS UNDER MANAGEMENT BY PRODUCT CATEGORY

(In billions)	Equity	Fixed-Income	Cash ⁽¹⁾	Multi-Asset-Class Solutions	Alternative Investments ⁽²⁾	Total
Balance as of December 31, 2015	\$1,326	\$ 312	\$ 368	\$ 103	\$ 136	\$2,245
Long-term institutional flows, net ⁽³⁾	(57)	(6)		14	(8)	(57)
ETF flows, net	37	9	—	—	6	52
Cash fund flows, net	—	—	(37)	—	—	(37)
Total flows, net	(20)	3	(37)	14	(2)	(42)
Market appreciation	140	10	—	9	14	173
Foreign exchange impact	(10)	(3)	(2)	(3)	(2)	(20)
Total market/foreign exchange impact	130	7	(2)	6	12	153
Acquisitions and transfers ⁽⁴⁾	38	56	4	3	11	112
Balance as of December 31, 2016	\$1,474	\$ 378	\$ 333	\$ 126	\$ 157	\$2,468
Long-term institutional flows, net ⁽³⁾	(74)	2		4	(21)	(89)
ETF flows, net	26	10	—	—	1	37
Cash fund flows, net	—	—	(8)	—	—	(8)
Total flows, net	(48)	12	(8)	4	(20)	(60)
Market appreciation	293	15	2	12	3	325
Foreign exchange impact	26	9	3	5	6	49
Total market/foreign exchange impact	319	24	5	17	9	374
Balance as of December 31, 2017	\$1,745	\$ 414	\$ 330	\$ 147	\$ 146	\$2,782
Long-term institutional flows, net ⁽³⁾	(45)	12	—	(3)	(2)	(38)
ETF flows, net	(3)	7	6	—	(2)	8
Cash fund flows, net	—	—	(50)	—	—	(50)
Total flows, net	(48)	19	(44)	(3)	(4)	(80)
Market appreciation (depreciation)	(142)	(7)	3	(10)	(10)	(166)
Foreign exchange impact	(11)	(4)	(2)	(2)	(6)	(25)
Total market/foreign exchange impact	(153)	(11)	1	(12)	(16)	(191)
Balance as of December 31, 2018	\$1,544	\$ 422	\$ 287	\$ 132	\$ 126	\$2,511

(1) Includes both floating- and constant-net-asset-value portfolios held in commingled structures or separate accounts.

(2) Includes real estate investment trusts, currency and commodities, including SPDR® Gold Shares ETF and SPDR® Long Dollar Gold Trust ETF. We are not the investment manager for the SPDR® Gold Shares ETF and SPDR® Long Dollar Gold Trust ETF, but act as the marketing agent.

(3) Amounts represent long-term portfolios, excluding ETFs.

(4) Includes AUM acquired as part of the acquisition of the GEAM business on July 1, 2016.

The preceding table does not include approximately \$37 billion of new asset management business which was awarded but not installed as of December 31, 2018. New business will be reflected in AUM in future periods after installation, and will generate management fee revenue in subsequent periods. Total AUM as of December 31, 2018 included managed assets lost but not liquidated. Lost business occurs from time to time and it is difficult to predict the timing of client behavior in transitioning these assets as the timing can vary significantly.

Expenses

Total expenses for Investment Management increased 20% in 2018 compared to 2017, reflecting the impact from the new revenue recognition standard which contributed approximately \$248 million to Investment Management expenses in 2018.

Additional information about expenses is provided under "Expenses" in "Consolidated Results of Operations" included in this Management's Discussion and Analysis in this Form 10-K.

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FINANCIAL CONDITION

The structure of our consolidated statement of condition is primarily driven by the liabilities generated by our Investment Servicing and Investment Management lines of business. Our clients' needs and our operating objectives determine balance sheet volume, mix and currency denomination. As our clients execute their worldwide cash management and investment activities, they utilize deposits and short-term investments that constitute the majority of our liabilities. These liabilities are generally in the form of interest-bearing transaction account deposits, which are denominated in a variety of currencies; non-interest-bearing demand deposits; and repurchase agreements, which generally serve as short-term investment alternatives for our clients.

Deposits and other liabilities resulting from client initiated transactions are invested in assets that generally have contractual maturities significantly longer than our liabilities; however, we evaluate the operational nature of our deposits and seek to maintain appropriate short-term liquidity of those liabilities that are not operational in nature and maintain longer-termed assets for our operational deposits. Our assets consist primarily of securities held in our AFS or HTM portfolios and short-duration financial instruments, such as interest-bearing deposits with banks and securities purchased under resale agreements. The actual mix of assets is determined by the characteristics of the client liabilities and our desire to maintain a well-diversified portfolio of high-quality assets.

TABLE 17: AVERAGE STATEMENT OF CONDITION⁽¹⁾

(In millions)	Years Ended December 31,		
	2018	2017	2016
	Average Balance	Average Balance	Average Balance
Assets:			
Interest-bearing deposits with banks	\$54,328	\$47,514	\$53,091
Securities purchased under resale agreements	2,901	2,131	2,558
Trading account assets	1,051	1,011	921
Investment securities	88,070	95,779	100,738
Loans and leases	23,573	21,916	19,013
Other interest-earning assets	15,714	22,884	22,863
Average total interest-earning assets	185,637	191,235	199,184
Cash and due from banks	3,178	3,097	3,157
Other non-interest-earning assets	34,570	25,118	27,386
Average total assets	\$223,385	\$219,450	\$229,727
Liabilities and shareholders' equity:			
Interest-bearing deposits:			
U.S.	\$54,953	\$30,623	\$30,107
Non-U.S.	70,623	91,937	95,551
Total interest-bearing deposits ⁽²⁾	125,576	122,560	125,658
Securities sold under repurchase agreements	2,048	3,683	4,113
Federal funds purchased	—	—	31
Other short-term borrowings	1,327	1,313	1,666
Long-term debt	10,686	11,595	11,401
Other interest-bearing liabilities	4,956	4,607	5,394
Average total interest-bearing liabilities	144,593	143,758	148,263
Non-interest-bearing deposits ⁽²⁾	35,832	41,248	44,827
Other non-interest-bearing liabilities	19,804	12,379	14,742
Preferred shareholders' equity	3,327	3,197	3,060

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Common shareholders' equity	19,829	18,868	18,835
Average total liabilities and shareholders' equity	\$223,385	\$219,450	\$229,727

(1) Additional information about our average statement of condition, primarily our interest-earning assets and interest-bearing liabilities, is provided in "Net Interest Income" included in this Management's Discussion and Analysis.

(2) Total deposits averaged \$161.4 billion for 2018, compared to \$163.8 billion and \$170.5 billion for 2017 and 2016, respectively.

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Investment Securities

TABLE 18: CARRYING VALUES OF INVESTMENT
SECURITIES

(In millions)	As of December 31,		
	2018	2017	2016
Available-for-sale:			
U.S. Treasury and federal agencies:			
Direct obligations	\$1,039	\$223	\$4,263
Mortgage-backed securities	15,968	10,872	13,257
Total U.S. Treasury and federal agencies	17,007	11,095	17,520
Asset-backed securities:			
Student loans ⁽¹⁾	541	3,358	5,596
Credit cards	583	1,542	1,351
Sub-prime	—	—	272
Other	593	1,447	905
Total asset-backed securities	1,717	6,347	8,124
Non-U.S. debt securities:			
Mortgage-backed securities	1,682	6,695	6,535
Asset-backed securities	1,574	2,947	2,516
Government securities	12,793	10,721	5,836
Other	6,602	6,108	5,613
Total non-U.S. debt securities	22,651	26,471	20,500
State and political subdivisions	1,918	9,151	10,322
Collateralized mortgage obligations	197	1,054	2,593
Other U.S. debt securities	1,658	2,560	2,469
U.S. equity securities ⁽²⁾	—	46	42
Non-U.S. equity securities ⁽²⁾	—	—	3
U.S. money-market mutual funds ⁽²⁾	—	397	409
Non-U.S. money-market mutual funds ⁽²⁾	—	—	16
Total	\$45,148	\$57,121	\$61,998
Held-to-maturity ⁽³⁾ :			
U.S. Treasury and federal agencies:			
Direct obligations	\$14,794	\$17,028	\$17,527
Mortgage-backed securities	21,647	16,651	10,334
Total U.S. Treasury and federal agencies	36,441	33,679	27,861
Asset-backed securities:			
Student loans ⁽¹⁾	3,191	3,047	2,883
Credit cards	193	798	897
Other	1	1	35
Total asset-backed securities	3,385	3,846	3,815
Non-U.S. debt securities:			
Mortgage-backed securities	638	939	1,150
Asset-backed securities	223	263	531
Government securities	358	474	286
Other	46	48	113
Total non-U.S. debt securities	1,265	1,724	2,080

Collateralized mortgage obligations	823	1,209	1,413
Total	\$41,914	\$40,458	\$35,169

(1) Primarily comprised of securities guaranteed by the federal government with respect to at least 97% of defaulted principal and accrued interest on the underlying loans.

(2) As described in Note 1 to the consolidated financial statements in this Form 10-K, upon adoption of ASU 2016-01 in 2018, we reclassified money-market funds and equity securities classified as AFS to held at fair value through profit and loss in other assets.

(3) Includes securities at amortized cost or fair value on the date of transfer from AFS.

Additional information about our investment securities portfolio is provided in Note 3 to the consolidated financial statements in this Form 10-K.

We manage our investment securities portfolio to align with the interest rate and duration characteristics of our client liabilities and in the context of the overall structure of our consolidated statement of condition, in consideration of the global interest rate environment. We consider a well-diversified, high-credit quality investment securities portfolio to be an important element in the management of our consolidated statement of condition.

Average duration of our investment securities portfolio increased to 3.1 years as of December 31, 2018, compared to 2.7 years as of December 31, 2017. The increase in securities duration reflects a shift towards a strategy where the investment portfolio will target less credit exposure and more HQLA interest rate exposure.

In 2018, \$1.2 billion of HTM securities, primarily consisting of MBS and CMBS, were transferred to AFS at book value and sold at a pre-tax loss of approximately \$36 million, due to our election to make a one-time transfer of securities in connection with the adoption of ASU 2017-12. For additional information on this new standard, refer to Note 1 to the consolidated financial statements in this Form 10-K.

In 2018, we sold approximately \$26 billion of non-HQLA securities, primarily ABS and municipal bonds, resulting in a net pre-tax gain of approximately \$9 million. A significant portion of the sales have been reinvested in HQLA and such investments will continue to occur over time with a portion likely to either be held in cash or cash equivalents or used to fund client lending activities.

In 2017, we sold \$12.2 billion of AFS securities, primarily agency MBS and U.S. treasury securities in our investment portfolio, to position for the then existing interest rate environment resulting in a pre-tax loss of \$39 million.

In 2018 and 2017, \$2.1 billion and \$496 million, respectively, of agency MBS, previously classified as AFS, were transferred to HTM. This transfer reflects our intent to hold these securities until their maturity. These securities were transferred at fair value, which included a net unrealized loss of \$53 million and \$2.8 million as of December 31, 2018 and 2017, respectively, within accumulated other comprehensive loss which will be accreted into interest income over the remaining life of the transferred security (ranging from approximately 10 to 42 years).

Approximately 90% of the carrying value of the portfolio was rated "AAA" or "AA" as of both December 31, 2018 and 2017.

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PORTFOLIO BY EXTERNAL
CREDIT RATING

	December		December	
	31, 2018		31, 2017	
AAA ⁽¹⁾	76	%	74	%
AA	14		16	
A	5		6	
BBB	5		4	
Below BBB	—		—	
	100	%	100	%

⁽¹⁾ Includes U.S. Treasury and federal agency securities that are split-rated, "AAA" by Moody's Investors Service and "AA+" by Standard & Poor's and also includes Agency MBS securities which are not explicitly rated but which have an explicit or assumed guarantee from the U.S. government.

As of December 31, 2018 and 2017, the investment portfolio was diversified with respect to asset class composition.

The following table presents the composition of these asset classes.

TABLE 20: INVESTMENT
PORTFOLIO BY ASSET CLASS

	December		December	
	31, 2018		31, 2017	
US Agency MBS	40	%	26	%
Foreign Sovereign	19		12	
US Treasuries	18		17	
ABS	11		22	
Other Credit	12		23	
	100	%	100	%

Non-U.S. Debt Securities

Approximately 27% of the aggregate carrying value of our investment securities portfolio was non-U.S. debt securities as of December 31, 2018, compared to approximately 29% as of December 31, 2017.

TABLE 21: NON-U.S. DEBT
SECURITIES

	As of December	
(In millions)	2018	2017
Available-for-sale:		
Australia	\$2,847	\$4,717
United Kingdom	2,580	5,721
Canada	2,185	3,066
France	1,875	2,500
Germany	1,547	529
Spain	1,504	1,413
Japan	1,352	1,319
Austria	1,312	234
Ireland	1,301	787
Netherlands	1,116	1,175

European ⁽¹⁾	1,087	—
Italy	1,010	1,645
Belgium	952	1,193
Finland	789	299
Hong Kong	458	666
Asian ⁽¹⁾	338	—
Sweden	186	538
Norway	94	514
Other ⁽²⁾	118	155
Total	\$22,651	\$26,471
Held-to-maturity:		
United Kingdom	\$363	\$410
Singapore	242	353
Netherlands	187	372
Australia	158	235
Germany	115	127
Spain	92	104
Other ⁽³⁾	108	123
Total	\$1,265	\$1,724

⁽¹⁾ Consists entirely of supranational bonds.

⁽²⁾ Included approximately \$78 million as of December 31, 2018, related to supranational bonds. Included approximately \$37 million as of December 31, 2017, related to Portugal, which was related to MBS and auto loans.

⁽³⁾ Included approximately \$61 million and \$75 million as of December 31, 2018 and December 31, 2017, respectively, related to Italy and Portugal, all of which were related to MBS.

Approximately 74% and 80% of the aggregate carrying value of these non-U.S. debt securities was rated “AAA” or “AA” as of December 31, 2018 and December 31, 2017, respectively. The majority of these securities comprised senior positions within the security structures; these positions have a level of protection provided through subordination and other forms of credit protection. As of December 31, 2018 and December 31, 2017, approximately 31% and 61%, respectively, of the aggregate carrying value of these non-U.S. debt securities was floating-rate.

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As of December 31, 2018, our non-U.S. debt securities had an average market-to-book ratio of 100.1%, and an aggregate pre-tax net unrealized gain of approximately \$37 million, composed of gross unrealized gains of \$118 million and gross unrealized losses of \$81 million. These unrealized amounts included:

a pre-tax net unrealized loss of \$32 million, composed of gross unrealized gains of \$40 million and gross unrealized losses of \$72 million, associated with non-U.S. debt securities AFS; and

a pre-tax net unrealized gain of \$69 million, composed of gross unrealized gains of \$78 million and gross unrealized losses of \$9 million, associated with non-U.S. debt securities HTM.

As of December 31, 2018, the underlying collateral for non-U.S. MBS and ABS primarily included U.K., Australian, Italian and Dutch mortgages as well as U.K. and Eurozone consumer ABS. The securities listed under "Canada" were composed of Canadian government securities and corporate debt and covered bonds. The securities listed under "France" were composed of sovereign bonds and corporate debt and covered bonds. The securities listed under "Japan" were substantially composed of Japanese government securities.

Municipal Obligations

We carried approximately \$1.92 billion of municipal securities classified as state and political subdivisions in our investment securities portfolio as of December 31, 2018 as shown in Table 18: Carrying Values of Investment Securities, all of which were classified as AFS. As of the same date, we also provided approximately \$9.43 billion of credit and liquidity facilities to municipal issuers.

TABLE 22: STATE AND MUNICIPAL OBLIGORS⁽¹⁾

(Dollars in millions)	Total Municipal Securities	Credit and Liquidity Facilities ⁽²⁾	Total	% of Total Municipal Exposure	
December 31, 2018					
State of Issuer:					
Texas	\$ 315	\$ 2,467	\$2,782	25	%
California	108	1,693	1,801	16	
New York	231	1,518	1,749	15	
Massachusetts	467	978	1,445	13	
Total	\$ 1,121	\$ 6,656	\$7,777		
December 31, 2017					
State of Issuer:					
Texas	\$ 1,713	\$ 1,622	\$3,335	18	%
California	415	2,237	2,652	14	
New York	742	1,288	2,030	11	
Massachusetts	859	991	1,850	10	
Washington	623	366	989	5	
Total	\$ 4,352	\$ 6,504	\$10,856		

⁽¹⁾ Represented 5% or more of our aggregate municipal credit exposure of approximately \$11.35 billion and \$18.47 billion across our businesses as of December 31, 2018 and December 31, 2017, respectively.

⁽²⁾ Includes municipal loans which are also presented within Table 24: U.S. and Non-U.S. Loans and Leases.

Our aggregate municipal securities exposure presented in Table 22: State and Municipal Obligors, was concentrated primarily with highly-rated counterparties, with approximately 81% of the obligors rated "AAA" or "AA" as of December 31, 2018. As of that date, approximately 25% and 75% of our aggregate municipal securities exposure was associated with general obligation and revenue bonds, respectively. The portfolios are also diversified geographically, with the states that represent our largest exposures widely dispersed across the U.S.

Additional information with respect to our assessment of OTTI of our municipal securities is provided in Note 3 to the consolidated financial statements in this Form 10-K.

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TABLE 23: CONTRACTUAL MATURITIES AND YIELDS

As of December 31, 2018 (Dollars in millions)	Under 1 Year		1 to 5 Years		6 to 10 Years		Over 10 Years	
	Amount	Yield	Amount	Yield	Amount	Yield	Amount	Yield
Available-for-sale ⁽¹⁾ :								
U.S. Treasury and federal agencies:								
Direct obligations	\$224	— %	\$815	2.74 %	\$—	— %	\$—	— %
Mortgage-backed securities	101	3.38	802	3.53	1,884	3.24	13,181	3.97
Total U.S. treasury and federal agencies	325		1,617		1,884		13,181	
Asset-backed securities:								
Student loans	57	3.37	164	3.27	250	3.14	70	5.14
Credit cards	199	1.67	294	1.96	90	3.21	—	—
Collateralized loan obligations	—	—	402	3.42	171	1.09	20	3.37
Total asset-backed securities	256		860		511		90	
Non-U.S. debt securities:								
Mortgage-backed securities	139	1.59	769	0.85	176	2.59	598	3.07
Asset-backed securities	136	0.36	698	0.85	581	0.68	159	0.57
Government securities	3,439	0.86	6,409	1.13	2,945	2.85	—	—
Other	1,071	1.03	4,575	1.32	937	1.07	19	3.64
Total non-U.S. debt securities	4,785		12,451		4,639		776	
State and political subdivisions ⁽²⁾	235	5.13	776	4.46	446	4.63	461	5.68
Collateralized mortgage obligations	2	3.51	—	—	—	—	195	3.53
Other U.S. debt securities	141	3.64	1,219	2.64	298	2.44	—	—
Total	\$5,744		\$16,923		\$7,778		\$14,703	
Held-to-maturity ⁽¹⁾ :								
U.S. Treasury and federal agencies:								
Direct obligations	\$4,002	1.91 %	\$10,737	2.27 %	\$12	2.66 %	\$43	2.58 %
Mortgage-backed securities	33	2.50	127	2.60	1,697	3.05	19,790	3.44
Total U.S. treasury and federal agencies	4,035		10,864		1,709		19,833	
Asset-backed securities:								
Student loans	7	2.65	291	3.02	267	3.02	2,626	3.19
Credit cards	58	2.72	135	2.85	—	—	—	—
Other	—	—	—	—	—	—	1	3.51
Total asset-backed securities	65		426		267		2,627	
Non-U.S. debt securities:								
Mortgage-backed securities	160	0.18	42	3.03	7	2.99	429	1.42
Asset-backed securities	96	1.23	127	1.23	—	—	—	—
Government securities	243	4.14	115	0.25	—	—	—	—
Other	46	—	—	—	—	—	—	—
Total non-U.S. debt securities	545		284		7		429	
Collateralized mortgage obligations	1	2.91	318	3.22	15	3.00	489	3.36
Total	\$4,646		\$11,892		\$1,998		\$23,378	

⁽¹⁾ The maturities of MBS, ABS and collateralized mortgage obligations are based on expected principal payments.

⁽²⁾ Yields were calculated on a fully taxable-equivalent basis, using applicable statutory tax rates (21% as of December 31, 2018).

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Impairment

Impairment exists when the fair value of an individual security is below its amortized cost basis. Impairment of a security is further assessed to determine whether such impairment is other-than-temporary. For AFS and HTM debt securities, we record impairment in our consolidated statement of income when management intends to sell (or may be required to sell) the securities before they recover in value, or when management expects the present value of cash flows expected to be collected from the securities to be less than the amortized cost of the impaired security (a credit loss).

We conduct periodic reviews of individual securities to assess whether OTTI exists. Our assessment of OTTI involves an evaluation of economic and security-specific factors. Such factors are based on estimates, derived by management, which contemplate current market conditions and security-specific performance. To the extent that market conditions are worse than management's expectations or due to idiosyncratic bond performance, OTTI could increase, in particular the credit-related component that would be recorded in our consolidated statement of income. Additional information with respect to OTTI, net impairment losses and gross unrealized losses is provided in Note 3 to the consolidated financial statements in this Form 10-K.

Our evaluation of potential OTTI of structured credit securities with collateral in the U.K. and continental Europe takes into account the outcome from the Brexit referendum and other geopolitical events, and assumes no disruption of payments on these securities.

Loans and Leases

TABLE 24: U.S. AND NON- U.S. LOANS AND LEASES

	As of December 31,				
(In millions)	2018	2017	2016	2015	2014
Domestic:					
Commercial and financial	\$ 19,479	\$ 18,696	\$ 16,412	\$ 15,899	\$ 14,515
Commercial real estate	874	98	27	28	28
Lease financing ⁽¹⁾	—	267	338	337	335
Total domestic	20,353	19,061	16,777	16,264	14,878
Non-U.S.:					
Commercial and financial	5,436	3,837	2,476	1,957	2,653
Lease financing ⁽¹⁾	—	396	504	578	668
Total non-U.S.	5,436	4,233	2,980	2,535	3,321
Total loans and leases	\$ 25,789	\$ 23,294	\$ 19,757	\$ 18,799	\$ 18,199
Average loans and leases	\$ 23,573	\$ 21,916	\$ 19,013	\$ 17,948	\$ 15,912

⁽¹⁾ We wound down our lease financing business in 2018.

Total loans and leases as of December 31, 2018 increased compared to December 31, 2017, primarily due to the expansion of the commercial real estate loan portfolio and increase in non-U.S. commercial and financial loans. As of December 31, 2018 and December 31, 2017, our investment in senior secured loans totaled approximately \$4.4 billion and \$3.5 billion, respectively. In addition, we had binding unfunded commitments as of December 31, 2018 and December 31, 2017 of \$238 million and \$279 million, respectively, to participate in such syndications. Additional information about these unfunded commitments is provided in Note 12 to the consolidated financial statements in this Form 10-K.

These senior secured loans, which are primarily rated "speculative" under our internal risk-rating framework (refer to Note 4 to the consolidated financial statements in this Form 10-K), are externally rated "BBB," "BB" or "B," with approximately 90% and 89% of the loans rated "BB" or "B" as of December 31, 2018 and December 31, 2017, respectively. Our investment strategy involves generally limiting our investment to larger, more liquid credits underwritten by major global financial institutions, applying our internal credit analysis process to each potential

investment and diversifying our exposure by counterparty and industry segment. However, these loans have significant exposure to credit losses relative to higher-rated loans in our portfolio.

Loans to municipalities included in the commercial and financial segment were \$0.9 billion and \$2.1 billion as of December 31, 2018 and December 31, 2017, respectively.

Additional information about all of our loan and leases segments, as well as underlying classes, is provided in Note 4 to the consolidated financial statements in this Form 10-K.

No loans were modified in troubled debt restructurings for the years ended December 31, 2018 and 2017.

TABLE 25: CONTRACTUAL MATURITIES FOR LOANS AND LEASES

(In millions)	As of December 31, 2018			Total
	Under 1 Year	1 to 5 Years	Over 5 Years	
Domestic:				
Commercial and financial	\$12,062	\$5,252	\$2,165	\$19,479
Commercial real estate	—	139	735	874
Lease financing	—	—	—	—
Total domestic	12,062	5,391	2,900	20,353
Non-U.S.:				
Commercial and financial	3,253	1,637	546	5,436
Lease financing	—	—	—	—
Total non-U.S.	3,253	1,637	546	5,436
Total loans and leases	\$15,315	\$7,028	\$3,446	\$25,789

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TABLE 26: CLASSIFICATION OF LOAN AND LEASE BALANCES DUE AFTER ONE YEAR

(In millions)	As of December 31, 2018
Loans and leases with predetermined interest rates	\$ 778
Loans and leases with floating or adjustable interest rates	9,696
Total	\$ 10,474

TABLE 27: ALLOWANCE FOR LOAN AND LEASE LOSSES

(In millions)	Years Ended December 31,				
	2018	2017	2016	2015	2014
Allowance for loan and lease losses:					
Beginning balance	\$54	\$53	\$46	\$38	\$28
Provision for loan and lease losses ⁽¹⁾	15	2	10	12	10
Charge-offs	(2)	(1)	(3)	(4)	—
Ending balance	\$67	\$54	\$53	\$46	\$38

⁽¹⁾ The provision for loan and lease losses is primarily related to commercial and financial loans.

We recorded a provision for loan losses of \$15 million in 2018 compared to \$2 million and \$10 million in 2017 and 2016, respectively. The provision increased in 2018 compared to 2017, primarily due to a higher volume of loans to non-investment grade borrowers composed of senior secured loans that we purchased in connection with our participation in loan syndications in the non-investment grade lending market. The charge-offs of \$2 million recorded in 2018 were associated with loan sales of senior secured loans to non-investment grade institutional borrowers. As of December 31, 2018 and December 31, 2017, approximately \$60 million and \$47 million, respectively, of our allowance for loan and lease losses was related to senior secured loans included in the commercial and financial segment. As this portfolio grows and matures, our allowance for loan and lease losses related to these loans may increase through additional provisions for credit losses.

Cross-Border Outstandings

Cross-border outstandings are amounts payable to us by non-U.S. counterparties which are denominated in U.S. dollars or other non-local currency, as well as non-U.S. local currency claims not funded by local currency liabilities. Our cross-border outstandings consist primarily of deposits with banks; loans and lease financing, including short-duration advances; investment securities; amounts related to foreign exchange and interest rate contracts; and securities finance. In addition to credit risk, cross-border outstandings have the risk that, as a result of political or economic conditions in a country, borrowers may be unable to meet their contractual repayment obligations of principal and/or interest when due because of the unavailability of, or restrictions on, foreign exchange needed by borrowers to repay their obligations.

As market and economic conditions change, the major independent credit rating agencies may downgrade U.S. and non-U.S. financial institutions and sovereign issuers which have been, and may in the future be, significant counterparties to us, or whose financial instruments serve as collateral on which we rely for credit risk mitigation purposes, and may do so again in the future. As a result, we may be exposed to increased counterparty risk, leading to negative ratings volatility.

The cross-border outstandings presented in Table 28: Cross-Border Outstandings, represented approximately 28%, 26% and 28% of our consolidated total assets as of December 31, 2018, 2017 and 2016, respectively.

TABLE 28: CROSS-BORDER OUTSTANDINGS⁽¹⁾

(In millions)	Investment Securities and	Derivatives and	Total Cross-Border Outstandings
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	Other Assets	Securities on Loan	
December 31, 2018			
Germany	\$ 20,157	\$ 489	\$ 20,646
Japan	13,985	1,084	15,069
United Kingdom	12,623	1,176	13,799
Australia	4,217	1,349	5,566
Canada	3,010	1,507	4,517
Ireland	2,019	809	2,828
France	2,495	294	2,789
Luxembourg	2,033	710	2,743
December 31, 2017			
Germany	\$ 18,201	\$ 295	\$ 18,496
Japan	15,250	549	15,799
United Kingdom	12,051	1,253	13,304
Australia	5,278	390	5,668
Canada	4,215	707	4,922
France	2,684	344	3,028
December 31, 2016			
United Kingdom	\$ 18,712	\$ 1,761	\$ 20,473
Japan	17,922	1,171	19,093
Germany	13,812	484	14,296
Australia	5,122	986	6,108
Luxembourg	3,389	762	4,151
Canada	3,179	781	3,960

⁽¹⁾ Cross-border outstandings included countries in which we do business, and which amounted to at least 1% of our consolidated total assets as of the dates indicated.

As of both December 31, 2018 and 2017, there were no countries whose aggregate cross-border outstandings amounted to between 0.75% and 1% of our consolidated assets. As of December 31, 2016, aggregate cross-border outstandings in countries which amounted to between 0.75% and 1% of our consolidated assets totaled approximately \$1.84 billion and \$2.38 billion in France and the Netherlands, respectively.

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Risk Management

General

In the normal course of our global business activities, we are exposed to a variety of risks, some inherent in the financial services industry, others more specific to our business activities. Our risk management framework focuses on material risks, which include the following:

- credit and counterparty risk;
- liquidity risk, funding and management;
- operational risk;
- information technology risk;
- market risk associated with our trading activities;
- market risk associated with our non-trading activities, which we refer to as asset-and-liability management, and which consists primarily of interest rate risk;
- strategic risk;
- model risk; and
- reputational, fiduciary and business conduct risk.

Many of these risks, as well as certain factors underlying each of these risks that could affect our businesses and our consolidated financial statements, are discussed in detail under "Risk Factors" in this Form 10-K.

The scope of our business requires that we balance these risks with a comprehensive and well-integrated risk management function. The identification, assessment, monitoring, mitigation and reporting of risks are essential to our financial performance and successful management of our businesses. These risks, if not effectively managed, can result in losses to us as well as erosion of our capital and damage to our reputation. Our approach, including Board and senior management oversight and a system of policies, procedures, limits, risk measurement and monitoring and internal controls, allows for an assessment of risks within a framework for evaluating opportunities for the prudent use of capital that appropriately balances risk and return.

Our objective is to optimize our return while operating at a prudent level of risk. In support of this objective, we have instituted a risk appetite framework that aligns our business strategy and financial objectives with the level of risk that we are willing to incur.

Our risk management is based on the following major goals:

- A culture of risk awareness that extends across all of our business activities;
- The identification, classification and quantification of our material risks;
- The establishment of our risk appetite and associated limits and policies, and our compliance with these limits;
- The establishment of a risk management structure at the "top of the house" that enables the control and coordination of risk-taking across the business lines;
- The implementation of stress testing practices and a dynamic risk-assessment capability;
- A direct link between risk and strategic-decision making processes and incentive compensation practices; and
- The overall flexibility to adapt to the ever-changing business and market conditions.

Our risk appetite framework outlines the quantitative limits and qualitative goals that define our risk appetite, as well as the responsibilities for measuring and monitoring risk against limits, and for reporting, escalating, approving and addressing exceptions. Our risk appetite framework is established by ERM, a corporate risk oversight group, in conjunction with the MRAC and the RC of the Board. The Board formally reviews and approves our risk appetite statement annually, or more frequently as required.

The risk appetite framework describes the level and types of risk that we are willing to accommodate in executing our business strategy, and also serves as a guide in setting risk limits across our business units. In addition to our risk appetite framework, we use stress testing as another important tool in our risk management practice. Additional information with respect to our stress testing process and practices is provided under "Capital" in this Management's Discussion and Analysis.

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Disclosures about our management of significant risks can be found on the following pages in this Management's Discussion and Analysis.

	Form 10-K Page Number
<u>Governance and Structure</u>	<u>80</u>
<u>Credit Risk Management</u>	<u>83</u>
<u>Liquidity Risk Management</u>	<u>88</u>
<u>Operational Risk Management</u>	<u>93</u>
Information Technology Risk Management	<u>96</u>
<u>Market Risk Management</u>	<u>97</u>
<u>Model Risk Management</u>	<u>104</u>
<u>Strategic Risk Management</u>	<u>105</u>

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Governance and Structure

We have an approach to risk management that involves all levels of management, from the Board and its committees, including its E&A Committee, RC, the ECC and TOPS, to each business unit and each employee. We allocate responsibility for risk oversight so that risk/return decisions are made at an appropriate level, and are subject to robust and effective review and challenge. Risk management is the responsibility of each employee, and is implemented through three lines of defense: the business units, which own and manage the risks inherent in their business, are considered the first line of defense; ERM and other support functions, such as Compliance, Finance and Vendor Management, provide the second line of defense; and Corporate Audit, which assesses the effectiveness of the first two lines of defense.

The responsibilities for effective review and challenge reside with senior managers, management oversight committees, Corporate Audit and, ultimately, the Board and its committees. While we believe that our risk management program is effective in managing the risks in our businesses, internal and external factors may create risks that cannot always be identified or anticipated.

Corporate-level risk committees provide focused oversight, and establish corporate standards and policies for specific risks, including credit, sovereign exposure, market, liquidity, operational, information technology as well as new business products, regulatory compliance and ethics, vendor risk and model risks. These committees have been delegated the responsibility to develop recommendations and remediation strategies to address issues that affect or have the potential to affect us.

We maintain a risk governance committee structure which serves as the formal governance mechanism through which we seek to undertake the consistent identification, management and mitigation of various risks facing us in connection with its business activities. This governance structure is enhanced and integrated through multi-disciplinary involvement, particularly through ERM. The following chart presents this structure.

Management Risk Governance Committee Structure

Executive Management Committees:

Management Risk and Capital Committee (MRAC)	Business Conduct Risk Committee (BCRC)	Technology and Operational Risk Committee (TORC)
--	--	--

Risk Committees:

Asset-Liability Committee (ALCO)	Credit Risk and Policy Committee (CRPC)	Fiduciary Review Committee	Operational Risk Committee	Technology Risk Committee
Trading and Market Risk Committee (TMRC)	Basel Oversight Committee (BOC)	New Business and Product Approval Committee	Global Transitions Oversight Committee	Executive Information Security Steering Committee
Recovery and Resolution Planning Executive Review Board	Model Risk Committee (MRC)	Compliance and Ethics Committee		

CCAR Steering Committee

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State Street Global	Legal Entity
Advisors Risk	Oversight Committee
Committee	

Country Risk Committee

Conduct Standards
Committee

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Enterprise Risk Management

The goal of ERM is to ensure that risks are proactively identified, well-understood and prudently managed in support of our business strategy. ERM provides risk oversight, support and coordination to allow for the consistent identification, measurement and management of risks across business units separate from the business units' activities, and is responsible for the formulation and maintenance of corporate-wide risk management policies and guidelines. In addition, ERM establishes and reviews limits and, in collaboration with business unit management, monitors key risks. Ultimately, ERM works to validate that risk-taking occurs within the risk appetite statement approved by the Board and conforms to associated risk policies, limits and guidelines.

The CRO is responsible for our risk management globally, leads ERM and has a dual reporting line to our CEO and the Board's RC. ERM manages its responsibilities globally through a three-dimensional organization structure:

- "Vertical" business unit-aligned risk groups that support business managers with risk management, measurement and monitoring activities;

- "Horizontal" risk groups that monitor the risks that cross all of our business units (for example, credit and operational risk); and

- Risk oversight for international activities, which combines intersecting "Verticals" and "Horizontals" through a hub and spoke model to provide important regional and legal entity perspectives to the global risk framework.

Sitting on top of this three-dimensional organization structure is a centralized group responsible for the aggregation of risk exposures across the vertical, horizontal and regional dimensions, for consolidated reporting, for setting the corporate-level risk appetite framework and associated limits and policies, and for dynamic risk assessment across our business.

Board Committees

The Board has four committees which assist it in discharging its responsibilities with respect to risk management: the RC, the E&A Committee, the ECC and the TOPS.

The RC is responsible for oversight related to the operation of our global risk management framework, including policies and procedures establishing risk management governance and processes and risk control infrastructure for our global operations. The RC is responsible for reviewing and discussing with management our assessment and management of all risks applicable to our operations, including credit, market, interest rate, liquidity, operational, regulatory

and business risks, as well as compliance and reputational risk and related policies.

In addition, the RC provides oversight of capital policies and capital planning, resolution planning and monitors capital adequacy in relation to risk. The RC is also responsible for discharging the duties and obligations of the Board under applicable Basel and other regulatory requirements.

The E&A Committee oversees management's operation of our comprehensive system of internal controls covering the integrity of our consolidated financial statements and reports, compliance with laws, regulations and corporate policies. The E&A Committee acts on behalf of the Board in monitoring and overseeing the performance of Corporate Audit and in reviewing certain communications with banking regulators. The E&A Committee has direct responsibility for the appointment, compensation, retention, evaluation and oversight of the work of our independent registered public accounting firm, including sole authority for the establishment of pre-approval policies and procedures for all audit engagements and any non-audit engagements.

The ECC has direct responsibility for the oversight of all compensation plans, policies and programs in which executive officers participate and incentive, retirement, welfare as well as equity plans in which certain of our other employees participate. In addition, the ECC oversees the alignment of our incentive compensation arrangements with our safety and soundness, including the integration of risk management objectives, and related policies, arrangements and control processes consistent with applicable related regulatory rules and guidance.

The TOPS leads and assists in the Board's oversight of technology and operational risk management and the role of these risks in executing our strategy and supporting our global business requirements. The TOPS reviews strategic

initiatives from a technology and operational risk perspective and reviews and approves technology-related risk matters.

Executive Management Committees

MRAC is the senior management decision-making body for risk and capital issues, and oversees our financial risks, our consolidated statement of condition, and our capital adequacy, liquidity and recovery and resolution planning. Its responsibilities include:

- The approval of the policies of our global risk, capital and liquidity management frameworks, including our risk appetite framework;
- The monitoring and assessment of our capital adequacy based on internal policies and regulatory requirements;

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The oversight of our firm-wide risk identification, model risk governance, stress testing and Recovery and Resolution Plan programs; and

The ongoing monitoring and review of risks undertaken within the businesses, and our senior management oversight and approval of risk strategies and tactics.

MRAC, is co-chaired by our CRO and CFO, who regularly present to the RC on developments in the risk environment and performance trends in our key business areas.

BCRC provides additional risk governance and leadership, by overseeing our business practices in terms of our compliance with laws, regulations and our standards of business conduct, our commitments to clients and others with whom we do business, and potential reputational risks. Management considers adherence to high ethical standards to be critical to the success of our business and to our reputation. The BCRC is co-chaired by our CCO and our Chief Legal Officer.

TORC oversees and assesses the effectiveness of corporate-wide technology and operational risk management programs, to manage and control technology and operational risk consistently across the organization. TORC is co-chaired by the CAO and the Chief Risk Officer.

Risk Committees

The following risk committees, under the oversight of the respective executive management committees, have focused responsibilities for oversight of specific areas of risk management:

Management Risk and Capital Committee

ALCO is the senior corporate oversight and decision-making body for balance sheet strategy, Global Treasury business activities and risk management for interest rate risk, liquidity risk and non-trading market risk. ALCO's roles and responsibilities are designed to be complementary to, and in coordination with the MRAC, which approves the corporate risk appetite and associated balance sheet strategy;

CRPC has primary responsibility for the oversight and review of credit and counterparty risk across business units, as well as oversight, review and approval of the credit risk policies and guidelines; the Committee consists of senior executives within ERM, and reviews policies and guidelines related to all aspects of our business which give rise to credit risk; our business units are also represented on the CRPC; credit risk policies and guidelines are reviewed periodically, but at least annually;

TMRC reviews the effectiveness of, and approves, the market risk framework at least annually; it is the senior oversight and decision-making committee for risk management within our global markets businesses; the TMRC is responsible for the formulation of guidelines, strategies and workflows with respect to the measurement, monitoring and control of our trading market risk, and also approves market risk tolerance limits, collateral and margin policies and trading authorities; the TMRC meets regularly to monitor the management of our trading market risk activities; BOC provides oversight and governance over Basel related regulatory requirements, assesses compliance with respect to Basel regulations and approves all material methodologies and changes, policies and reporting;

The Recovery and Resolution Planning Executive Review Board oversees the development of recovery and resolution plans as required by banking regulators;

MRC monitors the overall level of model risk and provides oversight of the model governance process pertaining to financial models, including the validation of key models and the ongoing monitoring of model performance. The MRC may also, as appropriate, mandate remedial actions and compensating controls to be applied to models to address modeling deficiencies as well as other issues identified;

The CCAR Steering Committee provides primary supervision of the stress tests performed in conformity with the Federal Reserve's CCAR process and the Dodd-Frank Act, and is responsible for the overall management, review, and approval of all material assumptions, methodologies, and results of each stress scenario;

The State Street Global Advisors Risk Committee is the most senior oversight and decision making committee for risk management within State Street Global Advisors; the committee is responsible for overseeing the alignment of State Street Global Advisors' strategy, and risk appetite, as well as alignment with our corporate-wide strategies and risk

management standards; and

• The Country Risk Committee oversees the identification, assessment, monitoring, reporting and mitigation, where necessary, of country risks.

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Business Conduct Risk Committee

The Fiduciary Review Committee reviews and assesses the fiduciary risk management programs of those units in which we serve in a fiduciary capacity;

The New Business and Product Approval Committee provides oversight of the evaluation of the risk inherent in proposed new products or services and new business, and extensions of existing products or services, evaluations including economic justification, material risk, compliance, regulatory and legal considerations, and capital and liquidity analyses;

The Compliance and Ethics Committee provides review and oversight of our compliance programs, including its culture of compliance and high standards of ethical behavior;

The Legal Entity Oversight Committee establishes standards with respect to the governance of our legal entities, monitors adherence to those standards, and oversees the ongoing evaluation of our legal entity structure, including the formation, maintenance and dissolution of legal entities; and

The Conduct Standards Committee provides oversight of our enforcement of employee conduct standards.

Technology and Operational Risk Committee

The Operational Risk Committee, along with the support of regional business or entity-specific working groups and committees, is responsible for oversight of our operational risk programs, including determining that the implementation of those programs is designed to identify, manage and control operational risk in an effective and consistent manner across the firm;

The Technology Risk Committee is responsible for the global oversight, review and monitoring of operational, legal and regulatory compliance and reputational risk that may result in a significant change to our Information Technology risk profile or a material financial loss or reputational impact to global technology services. The Committee serves as a forum to provide regular reporting to TORC and escalate technology risk and control issues to TORC, as appropriate;

The Executive Information Security Steering Committee provides direction for the Enterprise Information Security posture and program, including cyber security protections, provides enterprise-wide oversight and assessment of

the effectiveness of all Information Security Programs to promote that controls are measured and managed, and serves as an escalation point for cyber-security issues; and

The Global Transitions Oversight Committee is responsible for establishing a framework to monitor and oversee transitions between and among our legal entities against our resolvability principles, to monitor compliance with that framework to support optimization of our global operating footprint through increased consistency, transparency and sharing of best practices among our legal entities, and to serve as a forum for review and discussion of issues impacting internal transitions among our legal entities.

Credit Risk Management

Core Policies and Principles

We define credit risk as the risk of financial loss if a counterparty, borrower or obligor, collectively referred to as a counterparty, is either unable or unwilling to repay borrowings or settle a transaction in accordance with underlying contractual terms. We assume credit risk in our traditional non-trading lending activities, such as loans and contingent commitments, in our investment securities portfolio, where recourse to a counterparty exists, and in our direct and indirect trading activities, such as principal securities lending and foreign exchange and indemnified agency securities lending. We also assume credit risk in our day-to-day treasury and securities and other settlement operations, in the form of deposit placements and other cash balances, with central banks or private sector institutions.

We distinguish between three major types of credit risk:

Default risk - the risk that a counterparty fails to meet its contractual payment obligations;

Country risk - the risk that we may suffer a loss, in any given country, due to any of the following reasons:

deterioration of economic conditions, political and social upheaval, nationalization and appropriation of assets, government repudiation of indebtedness, exchange controls and disruptive currency depreciation or devaluation; and

Settlement risk - the risk that the settlement or clearance of transactions will fail, which arises whenever the exchange of cash, securities and/or other assets is not simultaneous.

The acceptance of credit risk by us is governed by corporate policies and guidelines, which include standardized procedures applied across the entire organization. These policies and guidelines include specific requirements related to each counterparty's

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risk profile; the markets served; counterparty, industry and country concentrations; and regulatory compliance. These policies and procedures also implement a number of core principles, which include the following:

- We measure and consolidate credit risks to each counterparty, or group of counterparties, in accordance with a "one-obligor" principle that aggregates risks across our business units;

- ERM reviews and approves all extensions of credit, or material changes to extensions of credit (such as changes in term, collateral structure or covenants), in accordance with assigned credit-approval authorities;

- Credit-approval authorities are assigned to individuals according to their qualifications, experience and training, and these authorities are periodically reviewed. Our largest exposures require approval by the Credit Committee, a sub-committee of the CRPC. With respect to small and low-risk extensions of credit to certain types of counterparties, approval authority is granted to individuals outside of ERM;

- We seek to avoid or limit undue concentrations of risk. Counterparty (or groups of counterparties), industry, country and product-specific concentrations of risk are subject to frequent review and approval in accordance with our risk appetite;

- We determine the creditworthiness of counterparties through a risk assessment, including the use of internal risk-rating methodologies;

- We seek to review all extensions of credit and the creditworthiness of counterparties at least annually. The nature and extent of these reviews are determined by the size, nature and term of the extensions of credit and the creditworthiness of the counterparty; and

- We subject all corporate policies and guidelines to annual review as an integral part of our periodic assessment of our risk appetite.

Our corporate policies and guidelines require that the business units which engage in activities that give rise to credit and counterparty risk comply with procedures that promote the extension of credit for legitimate business purposes; are consistent with the maintenance of proper credit standards; limit credit-related losses; and are consistent with our goal of maintaining a strong financial condition.

Structure and Organization

The Credit Risk group within ERM is responsible for the assessment, approval and monitoring of credit

risk across our business. The group is managed centrally, has dedicated teams in a number of locations worldwide across our businesses, and is responsible for related policies and procedures, and for our internal credit-rating systems and methodologies. In addition, the group, in conjunction with the business units, establishes measurements and limits to control the amount of credit risk accepted across its various business activities, both at the portfolio level and for each individual counterparty or group of counterparties, to individual industries, and also to counterparties by product and country of risk. These measurements and limits are reviewed periodically, but at least annually.

In conjunction with other groups in ERM, the Credit Risk group is jointly responsible for the design, implementation and oversight of our credit risk measurement and management systems, including data and assessment systems, quantification systems and the reporting framework.

Various key committees are responsible for the oversight of credit risk and associated credit risk policies, systems and models. All credit-related activities are governed by our risk appetite framework and our credit risk guidelines, which define our general philosophy with respect to credit risk and the manner in which we control, manage and monitor such risks.

The previously described CRPC (refer to "Risk Committees") has primary responsibility for the oversight, review and approval of the credit risk guidelines and policies. Credit risk guidelines and policies are reviewed periodically, but at least annually.

The Credit Committee, a sub-committee of the CRPC, has responsibility for assigning credit authority and approving the largest and higher-risk extensions of credit to individual counterparties or groups of counterparties.

CRPC provides periodic updates to MRAC and the Board's RC.

Credit Ratings

We perform initial and ongoing reviews to exercise due diligence on the creditworthiness of our counterparties when conducting any business with them or approving any credit limits.

This due diligence process generally includes the assignment of an internal credit rating, which is determined by the use of internally developed and validated methodologies, scorecards and a 15-grade rating scale. This risk-rating process incorporates the use of risk-rating tools in conjunction with management judgment; qualitative and quantitative inputs are captured in a replicable manner and, following a formal review and approval process, an internal credit rating based on our rating scale is assigned. Credit ratings are reviewed and approved by the Credit Risk group or designees within ERM. To facilitate comparability

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across the portfolio, counterparties within a given sector are rated using a risk-rating tool developed for that sector. Our risk-rating methodologies are approved by the CRPC, after completion of internal model validation processes, and are subject to an annual review, including re-validation.

We generally rate our counterparties individually, although accounts defined by us as low-risk are rated on a pooled basis. We evaluate and rate the credit risk of our counterparties on an ongoing basis.

Risk Parameter Estimates

Our internal risk-rating system seeks to promote a clear and consistent approach to the determination of appropriate credit risk classifications for our credit counterparties and exposures, tracking the changes in risk associated with these counterparties and exposures over time. This capability enhances our ability to more accurately calculate both risk exposures and capital, enabling better strategic decision making across the organization.

We use credit risk parameter estimates for the following purposes:

The assessment of the creditworthiness of new counterparties and, in conjunction with our risk appetite statement, the development of appropriate credit limits for our products and services, including loans, foreign exchange, securities finance, placements and repurchase agreements;

The use of an automated process for limit approvals for certain low-risk counterparties, as defined in our credit risk guidelines, based on the counterparty's probability-of-default, or PD, rating class;

The development of approval authority matrices based on PD; riskier counterparties with higher ratings require higher levels of approval for a comparable PD and limit size compared to less risky counterparties with lower ratings;

- The analysis of risk concentration trends using historical PD and exposure-at-default, or EAD, data;

The standardization of rating integrity testing by GCR using rating parameters;

The determination of the level of management review of short-duration advances depending on PD; riskier

counterparties with higher rating class values generally trigger higher levels of management escalation for comparable short-duration advances compared to less risky counterparties with lower rating-class values;

The monitoring of credit facility utilization levels using EAD values and the identification of instances where counterparties have exceeded limits;

The aggregation and comparison of counterparty exposures with risk appetite levels to determine if businesses are maintaining appropriate risk levels; and

The determination of our regulatory capital requirements for the AIRB provided in the Basel framework.

Credit Risk Mitigation

We seek to limit our credit exposure and reduce our potential credit losses through various types of risk mitigation. In our day-to-day management of credit risks, we utilize and recognize the following types of risk mitigation.

Collateral

In many parts of our business, we regularly require or agree for collateral to be received from or provided to clients and counterparties in connection with contracts that incur credit risk. In our trading businesses, this collateral is typically in the form of cash and highly-rated securities (government securities and other bonds or equity securities). Credit risks in our non-trading and securities finance businesses are also often secured by bonds and equity securities and by other types of assets. Collateral serves to reduce the risk of loss inherent in an exposure by improving the prospect of recovery in the event of a counterparty default. However, rapidly changing market values of the collateral we hold, unexpected increases in the credit exposure to a client or counterparty, reductions in the value or change in the type of securities held by us, as well as operational errors or errors in the manner in which we seek to exercise our rights, may reduce the risk mitigation effects of collateral or result in other security interests not being effective to reduce potential credit exposure. While collateral is often an alternative source of repayment, it generally does not replace the requirement within our policies and guidelines for high-quality underwriting standards. We also may choose to incur credit exposure without the benefit of collateral or other risk mitigating credits rights.

Our credit risk guidelines require that the collateral we accept for risk mitigation purposes is of high quality, can be reliably valued and can be liquidated if or when required. Generally, when collateral is of lower quality, more difficult to value or more challenging to liquidate, higher discounts to market values are applied for the purposes of measuring credit risk. For certain less liquid collateral, longer liquidation periods are assumed when determining the credit exposure.

All types of collateral are assessed regularly by ERM, as is the basis on which the collateral is valued.

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Our assessment of collateral, including the ability to liquidate collateral in the event of a counterparty default, and also with regard to market values of collateral under a variety of hypothetical market conditions, is an integral component of our assessment of risk and approval of credit limits. We also seek to identify, limit and monitor instances of "wrong-way" risk, where a counterparty's risk of default is positively correlated with the risk of our collateral eroding in value.

We maintain policies and procedures requiring that documentation used to collateralize a transaction is legal, valid, binding and enforceable in the relevant jurisdictions. We also conduct legal reviews to assess whether our documentation meets these standards on an ongoing basis.

Netting

Netting is a mechanism that allows institutions and counterparties to net offsetting exposures and payment obligations against one another through the use of qualifying master netting agreements. A master netting agreement allows the netting of rights and obligations arising under derivative or other transactions that have been entered into under such an agreement upon the counterparty's default, resulting in a single net claim owed by, or to, the counterparty. This is commonly referred to as "close-out netting," and is pursued wherever possible. We may also enter into master agreements that allow for the netting of amounts payable on a given day and in the same currency, reducing our settlement risk. This is commonly referred to as "payment netting," and is widely used in our foreign exchange activities.

As with collateral, we have policies and procedures in place to apply close-out and payment netting only to the extent that we have verified legal validity and enforceability of the master agreement. In the case of payment netting, operational constraints may preclude us from reducing settlement risk, notwithstanding the legal right to require the same under the master netting agreement. In the event we become unable, due to operational constraints, actions by regulators, changes in accounting principles, law or regulation (or related interpretations) or other factors, to net some or all of our offsetting exposures and payment obligations under those agreements, we would be required to gross up our assets and liabilities on our statement of condition and our calculation of RWA, accordingly. This would result in a potentially material increase in our regulatory ratios, including LCR, and present increased credit, liquidity, asset-and-liability management and operational risks, some of which could be material.

Guarantees

A guarantee is a financial instrument that results in credit support being provided by a third party, (i.e., the protection provider) to the underlying obligor (the

beneficiary of the provided protection) on account of an exposure owing by the obligor. The protection provider may support the underlying exposure either in whole or in part. Support of this kind may take different forms. Typical forms of guarantees provided to us include financial guarantees, letters of credit, bankers' acceptances, purchase undertaking agreements contracts and insurance.

We have established a review process to evaluate guarantees under the applicable requirements of our policies and Basel III requirements. Governance for this evaluation is covered under policies and procedures that require regular reviews of documentation, jurisdictions and credit quality of protection providers.

Pursuant to the Basel III final rule, we are permitted to reflect the application of credit risk mitigation which may include, for example, guarantees, collateral, netting, secured interests in non-financial assets and credit default swaps. We do not actively use credit default swaps as a risk mitigation tool, although it increasingly applies the recognition of guarantees, collateral and security over non-financial assets to mitigate overall risk within its counterparty credit portfolio.

Credit Limits

Central to our philosophy for our management of credit risk is the approval and imposition of credit limits, against which we monitor the actual and potential future credit exposure arising from our business activities with counterparties or groups of counterparties. Credit limits are a reflection of our risk appetite, which may be determined by the creditworthiness of the counterparty, the nature of the risk inherent in the business undertaken with the

counterparty, or a combination of relevant credit factors. Our risk appetite for certain sectors and certain countries and geographic regions may also influence the level of risk we are willing to assume to certain counterparties.

The analysis and approval of credit limits is undertaken in a consistent manner across our businesses, although the nature and extent of the analysis may vary, based on the type, term and magnitude of the risk being assumed. Credit limits and underlying exposures are assessed and measured on both a gross and net basis where appropriate, with net exposure determined by deducting the value of any collateral held. For certain types of risk being assumed, we will also assess and measure exposures under a variety of hypothetical market conditions. Credit limit approvals across our business are undertaken by the Credit Risk group, by individuals to whom credit authority has been delegated, or by the Credit Committee.

Credit limits are re-evaluated annually, or more frequently as needed, and are revised periodically on prevailing and anticipated market conditions, changes

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in counterparty or country-specific credit ratings and outlook, changes in our risk appetite for certain counterparties, sectors or countries, and enhancements to the measurement of credit utilization.

Reporting

Ongoing active monitoring and management of our credit risk is an integral part of our credit risk management framework. We maintain management information systems to identify, measure, monitor and report credit risk across businesses and legal entities, enabling ERM and our businesses to have timely access to accurate information on credit limits and exposures. Monitoring is performed along the dimensions of counterparty, industry, country and product-specific risks to facilitate the identification of concentrations of risk and emerging trends.

Key aspects of this credit risk reporting structure include governance and oversight groups, policies that define standards for the reporting of credit risk, data aggregation and sourcing systems and separate testing of relevant risk reporting functions by Corporate Audit.

The Credit Portfolio Management group routinely assesses the composition of our overall credit risk portfolio for alignment with our stated risk appetite. This assessment includes routine analysis and reporting of the portfolio, monitoring of market-based indicators, the assessment of industry trends and developments and regular reviews of concentrated risks. The Credit Portfolio Management group is also responsible, in conjunction with the business units, for defining the appetite for credit risk in the major sectors in which we have a concentration of business activities. These sector-level risk appetite statements, which include counterparty selection criteria and granular underwriting guidelines, are reviewed periodically and approved by the CRPC.

Monitoring

Regular surveillance of credit and counterparty risks is undertaken by our business units, the Credit Risk group and designees with ERM, allowing for frequent and extensive oversight. This surveillance process includes, but is not limited to, the following components:

Annual Reviews. A formal review of counterparties is conducted at least annually and includes a thorough review of operating performance, primary risk factors and our internal credit risk rating. This annual review also includes a review of current and proposed credit limits, an assessment of our ongoing risk appetite and verification that supporting legal documentation remains effective.

Interim Monitoring. Periodic monitoring of our largest and riskiest counterparties is undertaken more frequently, utilizing financial

information, market indicators and other relevant credit and performance measures. The nature and extent of this interim monitoring is individually tailored to certain counterparties and/or industry sectors to identify material changes to the risk profile of a counterparty (or group of counterparties) and assign an updated internal risk rating in a timely manner.

We maintain an active "watch list" for all counterparties where we have identified a concern that the actual or potential risk of default has increased. The watch list status denotes a concern with some aspect of a counterparty's risk profile that warrants closer monitoring of the counterparty's financial performance and related risk factors. Our ongoing monitoring processes are designed to facilitate the early identification of counterparties whose creditworthiness is deteriorating; any counterparty may be placed on the watch list by ERM at its sole discretion. Counterparties that receive an internal risk rating within a certain range on our rating scale are eligible for watch list designation. These risk ratings generally correspond with the non-investment grade or near non-investment grade ratings established by the major independent credit-rating agencies, and also include the regulatory classifications of "Special Mention," "Substandard," "Doubtful" and "Loss." Counterparties whose internal ratings are outside this range may also be placed on the watch list.

The Credit Risk group maintains primary responsibility for our watch list processes, and generates a monthly report of all watch list counterparties. The watch list is formally reviewed at least on a quarterly basis, with participation from senior ERM staff, and representatives from the business units and our corporate finance and legal groups as appropriate. These meetings include a review of individual watch list counterparties, together with credit limits and

prevailing exposures, and are focused on actions to contain, reduce or eliminate the risk of loss to us. Identified actions are documented and monitored.

Controls

GCR provides a separate level of surveillance and oversight over the integrity of our credit risk management processes, including the internal risk-rating system. GCR reviews counterparty credit ratings for all identified sectors on an ongoing basis. GCR is subject to oversight by the CRPC, and provides periodic updates to the Board's RC.

Specific activities of GCR include the following:

- Separate and objective assessments of our credit and counterparty exposures to determine the nature and extent of risk undertaken by the business units;

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Periodic credit process and credit product reviews, focusing on and assessing credit analysis, policy compliance, prudent transaction structure and underwriting standards, administration and documentation, risk-rating integrity and relevant trends;

• Identification and monitoring of developing counterparty, market and/or industry sector trends to limit risk of loss and protect capital;

• Regular and formal reporting of reviews, including findings and requisite actions to remedy identified deficiencies;

• Allocation of resources for specialized risk assessments (on an as-needed basis);

• Assessment of the level of the allowance for loan and lease losses and OTTI; and

• Liaison with auditors and regulatory personnel on matters relating to risk rating, reporting and measurement.

Reserve for Credit Losses

We maintain an allowance for loan and lease losses to support our on-balance sheet credit exposures. We also maintain a reserve for unfunded commitments and letters of credit to support our off-balance credit exposure. The two components together represent the reserve for credit losses. Review and evaluation of the adequacy of the reserve for credit losses is ongoing throughout the year, but occurs at least quarterly, and is based, among other factors, on our evaluation of the level of risk in the portfolio, the volume of adversely classified loans, previous loss experience, current trends, and economic conditions and their effect on our counterparties. Additional information about the allowance for loan and lease losses is provided in Note 4 to the consolidated financial statements in this Form 10-K.

Liquidity Risk Management

Our liquidity framework contemplates areas of potential risk based on our activities, size and other appropriate risk-related factors. In managing liquidity risk we employ limits, maintain established metrics and early warning indicators and perform routine stress testing to identify potential liquidity needs. This process involves the evaluation of a combination of internal and external scenarios which assist us in measuring our liquidity position and in identifying potential increases in cash needs or decreases in available sources of cash, as well as the potential impairment of our ability to access the global capital markets.

We manage our liquidity on a global, consolidated basis. We also manage liquidity on a stand-alone basis at our Parent Company, as well as at certain branches and subsidiaries of State Street Bank. State Street Bank generally has access to markets and funding sources limited to banks, such as the federal funds market and

the Federal Reserve's discount window. The Parent Company is managed to a more conservative liquidity profile, reflecting narrower market access. Additionally, the Parent Company typically holds, or has direct access to, primarily through SSIF (a direct subsidiary of the Parent Company), as discussed in "Supervision and Regulation" in Business in this Form 10-K, enough cash to meet its current debt maturities and cash needs, as well as those projected over the next one-year period. Absent financial distress at the Parent Company, the liquid assets available at SSIF continue to be available to the Parent Company. As of December 31, 2018, the value of our Parent Company's net liquid assets totaled \$486 million, compared with \$532 million as of December 31, 2017, which amount does not include available liquidity through SSIF. As of December 31, 2018, our Parent Company and State Street Bank have no senior notes or subordinated debentures outstanding that will mature in the next twelve months.

As a SIFI, our liquidity risk management activities are subject to heightened and evolving regulatory requirements, including interpretations of those requirements, under specific U.S. and international regulations and also resulting from published and unpublished guidance, supervisory activities, such as stress tests, resolution planning, examinations and other regulatory interactions. Satisfaction of these requirements could, in some cases, result in changes in the composition of our investment portfolio, reduced NII or NIM, a reduction in the level of certain business activities or modifications to the way in which we deliver our products and services. If we fail to meet regulatory requirements to the satisfaction of our regulators, we could receive negative regulatory stress test results, incur a resolution plan deficiency or determination of a non-credible resolution plan or otherwise receive an adverse regulatory finding. Our efforts to satisfy, or our failure to satisfy, these regulatory requirements could materially adversely affect our business, financial condition or results of operations.

Governance

Global Treasury is responsible for our management of liquidity. This includes the day-to-day management of our global liquidity position, the development and monitoring of early warning indicators, key liquidity risk metrics, the creation and execution of stress tests, the evaluation and implementation of regulatory requirements, the maintenance and execution of our liquidity guidelines and contingency funding plan, and routine management reporting to ALCO, MRAC and the Board's RC.

Global Treasury Risk Management, part of ERM, provides separate oversight over the identification, communication and management of Global Treasury's risks in support of our business strategy. Global

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Treasury Risk Management reports to the CRO. Global Treasury Risk Management's responsibilities relative to liquidity risk management include the development and review of policies and guidelines; the monitoring of limits related to adherence to the liquidity risk guidelines and associated reporting.

Liquidity Framework

Our liquidity framework contemplates areas of potential risk based on our activities, size and other appropriate risk-related factors. In managing liquidity risk we employ limits, maintain established metrics and early warning indicators, and perform routine stress testing to identify potential liquidity needs. This process involves the evaluation of a combination of internal and external scenarios which assist us in measuring our liquidity position and in identifying potential increases in cash needs or decreases in available sources of cash, as well as the potential impairment of our ability to access the global capital markets.

We manage liquidity according to several principles that are equally important to our overall liquidity risk management framework:

Structural liquidity management addresses liquidity by monitoring and directing the composition of our consolidated statement of condition. Structural liquidity is measured by metrics such as the percentage of total wholesale funds to consolidated total assets, and the percentage of non-government investment securities to client deposits. In addition, on a regular basis and as described below, our structural liquidity is evaluated under various stress scenarios.

Tactical liquidity management addresses our day-to-day funding requirements and is largely driven by changes in our primary source of funding, which are client deposits. Fluctuations in client deposits may be supplemented with short-term borrowings, which generally include commercial paper, repurchase agreements, FHLB products and certificates of deposit.

Stress testing and contingent funding planning are longer-term strategic liquidity risk management practices. Regular and ad hoc liquidity stress testing are performed under various severe but plausible scenarios at the consolidated level and at significant subsidiaries, including State Street Bank. These tests contemplate severe market and events specific to us under various time horizons and severities. Tests contemplate the impact of material changes in key funding sources, credit ratings, additional collateral requirements, contingent uses of funding, systemic shocks to the financial markets and operational failures based on market and

assumptions specific to us. The stress tests evaluate the required level of funding versus available sources in an adverse environment. As stress testing contemplates potential forward-looking scenarios, results also serve as a trigger to activate specific liquidity stress levels and contingent funding actions.

CFPs are designed to assist senior management with decision-making associated with any contingency funding response to a possible or actual crisis scenario. The CFPs define roles, responsibilities and management actions to be taken in the event of deterioration of our liquidity profile caused by either an event specific to us or a broader disruption in the capital markets. Specific actions are linked to the level of stress indicated by these measures or by management judgment of market conditions.

Liquidity Risk Metrics

In managing our liquidity, we employ early warning indicators and metrics. Early warning indicators are intended to detect situations which may result in a liquidity stress, including changes in our common stock price and the spread on our long-term debt. Additional metrics that are critical to the management of our consolidated statement of condition and monitored as part of our routine liquidity management include measures of our fungible cash position, purchased wholesale funds, unencumbered liquid assets, deposits and the total of investment securities and loans as a percentage of total client deposits.

Asset Liquidity

Central to the management of our liquidity is asset liquidity, which consists primarily of HQLA. HQLA is the amount of liquid assets that qualify for inclusion in the LCR. As a banking organization, we are subject to a minimum LCR under the LCR rule approved by U.S. banking regulators. The LCR is intended to promote the short-term resilience of internationally active banking organizations, like us, to improve the banking industry's ability to absorb shocks arising

from market stress over a 30 calendar day period and improve the measurement and management of liquidity risk. The LCR measures an institution's HQLA against its net cash outflows. HQLA primarily consists of unencumbered cash and certain high quality liquid securities that qualify for inclusion under the LCR rule. The LCR was fully implemented beginning on January 1, 2017. We report LCR to the Federal Reserve daily. For the quarters ended December 31, 2018 and December 31, 2017, daily average LCR for the Parent Company was 108% and 112%, respectively. The average HQLA for the Parent Company under the LCR final rule definition was \$91.67 billion and \$65.35 billion for the quarters ended December 31, 2018 and December 31, 2017, respectively.

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We maintained average cash balances in excess of regulatory requirements governing deposits with the Federal Reserve of approximately \$44.17 billion at the Federal Reserve, the ECB and other non-U.S. central banks as of December 31, 2018, compared to \$33.58 billion as of December 31, 2017. The higher levels of average cash balances with central banks was due to normal deposit volatility. The increase in average HQLA for the year ended December 31, 2018, compared to the year ended December 31, 2017, was primarily a result of the sale of approximately \$26 billion in non-HQLA securities during the year ended December 31, 2018, with a significant portion of the sales being reinvested into HQLA.

Liquid securities carried in our asset liquidity include securities pledged without corresponding advances from the FRBB, the FHLB, and other non-U.S. central banks. State Street Bank is a member of the FHLB. This membership allows for advances of liquidity in varying terms against high-quality collateral, which helps facilitate asset-and-liability management. As of December 31, 2018, we had approximately \$2 billion of outstanding borrowings from the FHLB. As of December 31, 2017, we had no outstanding borrowings from the FHLB. Access to primary, intra-day and contingent liquidity provided by these utilities is an important source of contingent liquidity with utilization subject to underlying conditions. As of December 31, 2018 and December 31, 2017 we had no outstanding primary credit borrowings from the FRBB discount window or any other central bank facility. In addition to the securities included in our asset liquidity, we have significant amounts of other unencumbered investment securities. These securities are available sources of liquidity, although not as rapidly deployed as those included in our asset liquidity.

The average fair value of total unencumbered securities was \$65.94 billion for the quarter ended December 31, 2018, compared to \$66.10 billion for the quarter ended December 31, 2017.

Measures of liquidity include LCR and NSFR, which are described in "Supervision and Regulation" in Business in this Form 10-K.

Uses of Liquidity

Significant uses of our liquidity could result from the following: withdrawals of client deposits; draw-downs by our custody clients of lines of credit; advances to clients to settle securities transactions; or other permitted purposes. Such circumstances would generally arise under stress conditions including deterioration in credit ratings. A recurring use of our liquidity involves our deployment of HQLA from our investment portfolio to post collateral to financial institutions serving as sources of securities under our enhanced custody program.

We had unfunded commitments to extend credit with gross contractual amounts totaling \$28.95 billion and \$26.49 billion and standby letters of credit totaling \$2.99 billion and \$3.16 billion as of December 31, 2018 and December 31, 2017, respectively. These amounts do not reflect the value of any collateral. As of December 31, 2018, approximately 73% of our unfunded commitments to extend credit and 27% of our standby letters of credit expire within one year. Since many of our commitments are expected to expire or renew without being drawn upon, the gross contractual amounts do not necessarily represent our future cash requirements.

Information about our resolution planning and the impact actions under our resolution plans could have on our liquidity is provided in "Supervision and Regulation" in Business in this Form 10-K.

Funding

Deposits

We provide products and services including custody, accounting, administration, daily pricing, foreign exchange services, cash management, financial asset management, securities finance and investment advisory services. As a provider of these products and services, we generate client deposits, which have generally provided a stable, low-cost source of funds. As a global custodian, clients place deposits with our entities in various currencies. As of both December 31, 2018 and 2017, approximately 60% of our average total deposit balances were denominated in U.S. dollars, approximately 20% in EUR, 10% in GBP and 10% in all other currencies.

Short-Term Funding

Our on-balance sheet liquid assets are also an integral component of our liquidity management strategy. These assets provide liquidity through maturities of the assets, but more importantly, they provide us with the ability to raise funds by pledging the securities as collateral for borrowings or through outright sales. In addition, our access to the global capital markets gives us the ability to source incremental funding from wholesale investors. As discussed earlier under “Asset Liquidity,” State Street Bank’s membership in the FHLB allows for advances of liquidity with varying terms against high-quality collateral.

Short-term secured funding also comes in the form of securities lent or sold under agreements to repurchase. These transactions are short-term in nature, generally overnight and are collateralized by high-quality investment securities. These balances were \$1.08 billion and \$2.84 billion as of December 31, 2018 and December 31, 2017, respectively.

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State Street Bank currently maintains a line of credit with a financial institution of CAD 1.40 billion, or approximately \$1.03 billion, as of December 31, 2018, to support its Canadian securities processing operations. The line of credit has no stated termination date and is cancelable by either party with prior notice. As of December 31, 2018, there was no balance outstanding on this line of credit.

Long-Term Funding

We have the ability to issue debt and equity securities under our current universal shelf registration statement to meet current commitments and business needs, including accommodating the transaction and cash management needs of our clients. In addition, State Street Bank also has current authorization from the Board to issue up to \$5 billion in unsecured senior debt and an additional \$500 million of subordinated debt.

Agency Credit Ratings

Our ability to maintain consistent access to liquidity is fostered by the maintenance of high investment grade ratings as measured by the major independent credit rating agencies. Factors essential to maintaining high credit ratings include:

- diverse and stable core earnings;
- relative market position;
- strong risk management;
- strong capital ratios;
- diverse liquidity sources, including the global capital markets and client deposits;
- strong liquidity monitoring procedures; and
- preparedness for current or future regulatory developments.

High ratings limit borrowing costs and enhance our liquidity by:

- providing assurance for unsecured funding and depositors;
- increasing the potential market for our debt and improving our ability to offer products;
- serving markets; and
- engaging in transactions in which clients value high credit ratings.

A downgrade or reduction of our credit ratings could have a material adverse effect on our liquidity by restricting our ability to access the capital markets, which could increase the related cost of funds. In turn, this could cause the sudden and large-scale withdrawal of unsecured deposits by our clients, which could lead to draw-downs of unfunded commitments to extend credit or trigger requirements under securities purchase commitments; or require additional collateral or force terminations of certain trading derivative contracts.

A majority of our derivative contracts have been entered into under bilateral agreements with counterparties who may require us to post collateral or terminate the transactions based on changes in our credit ratings. We assess the impact of these arrangements by determining the collateral that would be required assuming a downgrade by all rating agencies. The additional collateral or termination payments related to our net derivative liabilities under these arrangements that could have been called by counterparties in the event of a downgrade in our credit ratings below levels specified in the agreements is provided in Note 10 to the consolidated financial statements in this Form 10-K. Other funding sources, such as secured financing transactions and other margin requirements, for which there are no explicit triggers, could also be adversely affected.

TABLE 29: CREDIT RATINGS

As of December 31, 2018

Standard & Poor's Moody's Investors Service Fitch

State Street:

Senior debt	A	A1	AA-
Subordinated debt	A-	A2	A+
Junior subordinated debt	BBB	A3	BBB+
Preferred stock	BBB	Baa1	BBB

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Outlook	Stable	Stable	Stable
State Street Bank:			
Short-term deposits	A-1+	P-1	F1+
Long-term deposits	AA-	Aa1	AA+
Senior debt/Long-term issuer	AA-	Aa3	AA
Subordinated debt	A	Aa3	A+
Outlook	Stable	Stable	Stable

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Contractual Cash Obligations and Other Commitments

The long-term contractual cash obligations included within Table 30: Long-Term Contractual Cash Obligations were recorded in our consolidated statement of condition as of December 31, 2018, except for operating leases and the interest portions of long-term debt and capital leases.

TABLE 30: LONG-TERM CONTRACTUAL CASH OBLIGATIONS

December 31, 2018 (In millions)	Payments Due by Period				Total
	Less than 1 year	1-3 years	4-5 years	Over 5 years	
Long-term debt ⁽¹⁾⁽²⁾	\$ —	\$3,132	\$2,712	\$5,059	\$10,903
Operating leases	192	351	275	380	1,198
Capital lease obligations ⁽²⁾	34	62	55	—	151
Tax liability	—	—	23	24	47
Total contractual cash obligations	\$ 226	\$3,545	\$3,065	\$5,463	\$12,299

⁽¹⁾ Long-term debt excludes capital lease obligations (presented as a separate line item) and the effect of interest rate swaps. Interest payments were calculated at the stated rate with the exception of floating-rate debt, for which payments were calculated using the indexed rate in effect as of December 31, 2018.

⁽²⁾ Additional information about contractual cash obligations related to long-term debt and operating and capital leases is provided in Notes 9 and 20 to the consolidated financial statements in this Form 10-K.

Total contractual cash obligations shown in Table 30: Long-Term Contractual Cash Obligations, do not include: Obligations which will be settled in cash, primarily in less than one year, such as client deposits, federal funds purchased, securities sold under repurchase agreements and other short-term borrowings. Additional information about deposits, federal funds purchased, securities sold under repurchase agreements and other short-term borrowings is provided in Note 8 to the consolidated financial statements in this Form 10-K.

Obligations related to derivative instruments because the derivative-related amounts recorded in our consolidated statement of condition as of December 31, 2018 did not represent the amounts that may ultimately be paid under the contracts upon settlement. Additional information about our derivative instruments is provided in Note 10 to the consolidated financial statements in this Form 10-K. We have obligations under pension and other post-retirement benefit plans, with additional information provided in Note 19 to the consolidated financial statements in this Form 10-K, which are not included in Table 30: Long-Term Contractual Cash Obligations.

TABLE 31: OTHER COMMERCIAL COMMITMENTS

(In millions)	Duration of Commitment as of December 31, 2018				Total amounts committed ⁽¹⁾
	Less than 1 year	1-3 years	4-5 years	Over 5 years	
Indemnified securities financing	\$342,337	\$—	\$—	\$—	\$ 342,337
Unfunded credit facilities	18,838	5,600	3,979	535	28,952
Standby letters of credit	814	1,057	1,114	—	2,985
Purchase obligations ⁽²⁾	64	89	33	27	213
Total commercial commitments	\$362,053	\$6,746	\$5,126	\$ 562	\$ 374,487

⁽¹⁾ Total amounts committed reflect participations to independent third parties, if any.

⁽²⁾ Amounts represent obligations pursuant to legally binding agreements, where we have agreed to purchase products or services with a specific minimum quantity defined at a fixed, minimum or variable price over a specified period of time.

Additional information about the commitments presented in Table 31: Other Commercial Commitments, except for purchase obligations, is provided in Note 12 to the consolidated financial statements in this Form 10-K.

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Operational Risk Management

Overview

Operational risk is the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. Operational risk encompasses fiduciary risk and legal risk. Fiduciary risk is defined as the risk that we fail to properly exercise our fiduciary duties in our provision of products or services to clients. Legal risk is the risk of loss resulting from failure to comply with laws and contractual obligations.

Operational risk is inherent in the performance of investment servicing and investment management activities on behalf of our clients. Whether it be fiduciary risk, risk associated with execution and processing or other types of operational risk, a consistent, transparent and effective operational risk framework is key to identifying, monitoring and managing operational risk.

We have established an operational risk framework that is based on three major goals:

- Strong, active governance;
- Ownership and accountability; and
- Consistency and transparency.

Governance

Our Board is responsible for the approval and oversight of our overall operational risk framework. It does so through its RC, which reviews our operational risk framework and approves our operational risk policy annually.

Our operational risk policy establishes our approach to our management of operational risk across our business. The policy identifies the responsibilities of individuals and committees charged with oversight of the management of operational risk, and articulates a broad mandate that supports implementation of the operational risk framework.

ERM and other control groups provide the oversight, validation and verification of the management and measurement of operational risk.

Executive management actively manages and oversees our operational risk framework through membership on various risk management committees, including MRAC, the BCRC, TORC, the Operational Risk Committee, the Executive Information Security Steering Committee, Business Controls Steering Committee, Compliance and Ethics Committee and the Fiduciary Review Committee, all of which ultimately report to the appropriate committee of the Board.

The Operational Risk Committee, chaired by the global head of Operational Risk and co-chaired by the FLOD Head of Business Controls, provides cross-business oversight of operational risk, operational risk programs and their implementation to identify, measure, manage and control operational risk in an effective and

consistent manner and reviews and approves operational risk guidelines intended to maintain a consistent implementation of our corporate operational risk policy and framework.

Ownership and Accountability

We have implemented our operational risk framework to support the broad mandate established by our operational risk policy. This framework represents an integrated set of processes and tools that assists us in the management and measurement of operational risk, including our calculation of required capital and RWA.

The framework takes a comprehensive view and integrates the methods and tools used to manage and measure operational risk. The framework utilizes aspects of the COSO framework and other industry leading practices, and is designed foremost to address our risk management needs while complying with regulatory requirements. The operational risk framework is intended to provide a number of important benefits, including:

- A common understanding of operational risk management and its supporting processes;
- The clarification of responsibilities for the management of operational risk across our business;
- The alignment of business priorities with risk management objectives;
- The active management of risk and early identification of emerging risks;
- The consistent application of policies and the collection of data for risk management and measurement; and
- The estimation of our operational risk capital requirement.

The operational risk framework employs a distributed risk management infrastructure executed by ERM groups aligned with the business units, which are responsible for the implementation of the operational risk framework at the business unit level.

As with other risks, senior business unit management is responsible for the day-to-day operational risk management of their respective businesses. It is business unit management's responsibility to provide oversight of the implementation and ongoing execution of the operational risk framework within their respective organizations, as well as coordination and communication with ERM.

Consistency and Transparency

A number of corporate control functions are directly responsible for implementing and assessing various aspects of our operational risk framework, with

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the overarching goal of consistency and transparency to meet the evolving needs of the business:

The global head of Operational Risk, a member of the CRO's executive management team, leads ERM's corporate ORM group. ORM is responsible for the strategy, evolution and consistent implementation of our operational risk guidelines, framework and supporting tools across our business. ORM reviews and analyzes operational key risk information, events, metrics and indicators at the business unit and corporate level for purposes of risk management, reporting and escalation to the CRO, senior management and governance committees;

ERM's Corporate Risk Analytics group develops and maintains operational risk capital estimation models, and ORM's Capital Analysis group calculates our required capital for operational risk;

ERM's MVG independently validates the quantitative models used to measure operational risk, and ORM performs validation checks on the output of the model;

CIS establishes the framework, policies and related programs to measure, monitor and report on information security risks, including the effectiveness of cyber security program protections. CIS defines and manages the enterprise-wide information security program. CIS coordinates with Information Technology, control functions and business units to support the confidentiality, integrity and availability of corporate information assets. CIS identifies and employs a risk-based methodology consistent with applicable regulatory cyber security requirements and monitors the compliance of our systems with information security policies; and

Corporate Audit performs separate reviews of the application of operational risk management practices and methodologies utilized across our business.

Our operational risk framework consists of five components, each described below, which provide a working structure that integrates distinct risk programs into a continuous process focused on managing and measuring operational risk in a coordinated and consistent manner.

Risk Identification and Assessments

The objective of risk identification and assessments is to understand business unit strategy, risk profile and potential exposures. It is achieved through a series of risk assessments across our business using techniques for the identification, assessment and measurement of risk across a spectrum of potential frequency and severity combinations. Three primary risk assessment programs, which occur annually, augmented by other business-specific programs, are the core of this component:

The risk assessment program seeks to understand the risks associated with day-to-day activities, and the effectiveness of controls intended to manage potential exposures arising from these activities. These risks are typically frequent in nature but generally not severe in terms of exposure;

The Material Risk Identification process utilizes a bottom-up approach to identify our most significant risk exposures across all on- and off-balance sheet risk-taking activities. The program is specifically designed to consider risks that could have a material impact irrespective of their likelihood or frequency. This can include risks that may have an impact on longer-term business objectives, such as significant change management activities or long-term strategic initiatives;

The Scenario Analysis program focuses on the set of risks with the highest severity and most relevance from a capital perspective. These are generally referred to as "tail risks," and serve as important benchmarks for our loss distribution approach model (see below); they also provide inputs into stress testing; and

Business-specific programs to identify, assess and measure risk, including new business and product review and approval, new client screening, and, as deemed appropriate, targeted risk assessments.

Capital Analysis

The primary measurement tool used is an internally developed loss distribution approach (LDA) model. We use the LDA model to quantify required operational risk capital, from which we calculate RWA related to operational risk. Such required capital and RWA totaled \$3.68 billion and \$46.06 billion, respectively, as of December 31, 2018, compared to \$3.67 billion and \$45.82 billion, respectively, as of December 31, 2017; refer to the "Capital" section in "Financial Condition," of this Management's Discussion and Analysis.

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The LDA model incorporates the four required operational risk elements described below:

Internal loss event data is collected from across our business in conformity with our operating loss policy that establishes the requirements for collecting and reporting individual loss events. We categorize the data into seven Basel-defined event types and further subdivide the data by business unit, as deemed appropriate. Each of these loss events are represented in a UOM which is used to estimate a specific amount of capital required for the types of loss events that fall into each specific category. Some UOMs are measured at the corporate level because they are not "business specific," such as damage to physical assets, where the cause of an event is not primarily driven by the behavior of a single business unit. Internal losses of \$500 or greater are captured, analyzed and included in the modeling approach. Loss event data is collected using a corporate-wide data collection tool, which stores the data in a Loss Event Data Repository (LEDR) to support processes related to analysis, management reporting and the calculation of required capital. Internal loss event data provides our frequency and severity information to our capital calculation process for historical loss events experienced by us. Internal loss event data may be incorporated into our LDA model in a future quarter following the realization of the losses, with the timing and categorization dependent on the processes for model updates and, if applicable, model revalidation and regulatory review and related supervisory processes. An individual loss event can have a significant effect on the output of our LDA model and our operational risk RWA under the advanced approaches depending on the severity of the loss event, its categorization among the seven Basel-defined UOMs and the stability of the distributional approach for a particular UOM;

External loss event data provides information with respect to loss event severity from other financial institutions to inform our capital estimation process of events in similar business units at other banking organizations. This information supplements the data pool available for use in our LDA model. Assessments of the sufficiency of internal data and the relevance of external data are completed before pooling the two data sources for use in our LDA model; Scenario analysis workshops are conducted across our business to inform management of the less frequent but most severe, or "tail," risks

that the organization faces. The workshops are attended by senior business unit managers, other support and control partners and business-aligned risk management staff. The workshops are designed to capture information about the significant risks and to estimate potential exposures for individual risks should a loss event occur. The results of these workshops are used to make a comparison to our LDA model results to determine that our calculation of required capital considers relevant risk-related information; and

Business environment and internal control factors are gathered as part of our scenario analysis program to inform the scenario analysis workshop participants of internal loss event data and business-relevant metrics, such as risk assessment program results, along with industry loss event data and case studies where appropriate. Business environment and internal control factors are those characteristics of a bank's internal and external operating environment that bear an exposure to operational risk. The use of this information indirectly influences our calculation of required capital by providing additional relevant data to workshop participants when reviewing specific UOM risks.

Monitoring, Reporting and Analytics

The objective of risk monitoring is to proactively monitor the changing business environment and corresponding operational risk exposure. It is achieved through a series of quantitative and qualitative monitoring tools that are designed to allow us to understand changes in the business environment, internal control factors, risk metrics, risk assessments, exposures and operating effectiveness, as well as details of loss events and progress on risk initiatives implemented to mitigate potential risk exposures.

Operational risk reporting is intended to provide transparency, thereby enabling management to manage risk, provide oversight and escalate issues in a timely manner. It is designed to allow the business units, executive management, and the Board's control functions and committees to gain insight into activities that may result in risks and potential exposures. Reports are intended to identify business activities that are experiencing processing issues, whether or not they result in actual loss events. Reporting includes results of monitoring activities, internal and external

examinations, regulatory reviews and control assessments. These elements combine in a manner designed to provide a view of potential and emerging risks facing us and information that details its progress on managing risks.

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Effectiveness and Testing

The objective of effectiveness and testing is to verify that internal controls are designed appropriately, are consistent with corporate and regulatory standards, and are operating effectively. It is achieved through a series of assessments by both internal and external parties, including Corporate Audit, independent registered public accounting firms, business self-assessments and other control function reviews, such as a SOX testing program.

Consistent with our standard model validation process, the operational risk LDA model is subject to a detailed review, overseen by the MRC. In addition, the model is subject to a rigorous internal governance process. All changes to the model or input parameters, and the deployment of model updates, are reviewed and approved by the Operational Risk Committee, which has oversight responsibility for the model, with technical input from the MRC.

Documentation and Guidelines

Documentation and guidelines allow for consistency and repeatability of the various processes that support the operational risk framework across our business.

Operational risk guidelines document our practices and describe the key elements in a business unit's operational risk management program. The purpose of the guidelines is to set forth and define key operational risk terms, provide further detail on our operational risk programs, and detail the business units' responsibilities to identify, assess, measure, monitor and report operational risk. The guideline supports our operational risk policy.

Data standards have been established to maintain consistent data repositories and systems that are controlled, accurate and available on a timely basis to support operational risk management.

Information Technology Risk Management

Overview and Principles

We define technology risk as the risk associated with the use, ownership, operation, involvement, influence and adoption of information technology. Technology risk includes risks potentially triggered by technology non-compliance with regulatory obligations, information security and privacy incidents, business disruption, technology internal control and process gaps, technology operational events and adoption of new business technologies.

The principal technology risks within our technology risk policy and risk appetite framework include:

- Third party vendor risk;
- Business disruption and technology resiliency risk;

• Cyber and information security risk;

• Technology asset and configuration risk; and

• Technology obsolescence risk.

Governance

Our Board is responsible for the approval and oversight of our overall technology risk framework and program. It does so through its TOPS, which reviews and approves our technology risk policy and appetite framework annually. Our technology risk policy establishes our approach to our management of technology risk across our business. The policy identifies the responsibilities of individuals and committees charged with oversight of the management of technology risk and articulates a broad mandate that supports implementation of the technology risk framework. Risk control functions in the business are responsible for adopting and executing the Enterprise Technology Risk Management (ETRM), technology risk framework and reporting requirements. They do this, in part, by developing and maintaining an inventory of critical applications and supporting infrastructure, as well as identifying, assessing and measuring technology risk utilizing the ETRM framework. They are also responsible for monitoring and evaluating risk on a continual basis using key risk indicators, risk reporting and adopting appropriate risk responses to risk issues.

The Chief Technology Risk Officer, a member of the CRO's executive management team, leads the ETRM. ETRM is the separate risk function responsible for the technology risk strategy and appetite, and technology risk framework development and execution. ETRM also performs overall technology risk monitoring and reporting to the Board, and

provides a separate view of the technology risk posture to executive leadership.

We manage technology risks by:

- Coordinating various risk assessment and risk management activities, including ERM operational risk programs;
- Establishing, through TORC and TOPS of the Board, the enterprise level technology risk and cyber risk appetite and limits;
- Producing enterprise level risk reporting, aggregation, dashboards, profiles and risk appetite statements;
- Validating appropriateness of reporting of information technology risks and risk acceptance to senior management risk committees and the Board;
- Promoting a strong technology risk culture through communication;

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Serving as an escalation and challenge point for technology risk policy guidance, expectations and clarifications; Assessing effectiveness of key enterprise information technology risk and internal control remediation programs; and Providing risk oversight, challenge and monitoring for the Global Continuity and Third Party Vendor Management Program, including the collection of risk appetite, metrics and KRIs, and reviewing issue management processes and consistent program adoption.

Cyber-Security Risk Management

Cyber-security risk is managed as part of our overall Information Technology Risk Management as outlined above. We recognize the significance of cyber-attacks and have taken steps to mitigate the risks associated with them. We have made significant investments in building a mature cyber-security program to leverage people, technology and processes to protect our systems and the data in our care. We have also implemented a program to help us better measure and manage the cyber-security risk we face when we engage with third parties for services.

All employees are required to adhere to our cyber-security policy and standards. Our centralized information security group provides education and training. This training includes a required annual online training class for all employees, multiple simulated phishing attacks and regular information security awareness materials.

Our business lines employ Information Security Officers to help the business better understand and manage their information security risks, as well as to work with the centralized Information Security team to drive awareness and compliance throughout the business.

We use independent third parties to perform ethical hacks of key systems to help us better understand the effectiveness of our controls and to better implement more effective controls, and we engage with third parties to conduct reviews of our overall program to help us better align our cyber-security program with what is required of a large financial services organization.

We have an incident response program in place that is designed to enable a well-coordinated response to mitigate the impact of cyber-attacks, recover from the attack and to drive the appropriate level of communication to internal and external stakeholders.

The TORC assesses and manages the effectiveness of our cyber-security program, which is overseen by the TOPS of our Board. The TOPS receives regular cyber-security updates throughout the

year and is responsible for reviewing and approving the program on an annual basis.

Market Risk Management

Market risk is defined by U.S. banking regulators as the risk of loss that could result from broad market movements, such as changes in the general level of interest rates, credit spreads, foreign exchange rates or commodity prices. We are exposed to market risk in both our trading and certain of our non-trading, or asset-and-liability management, activities.

Information about the market risk associated with our trading activities is provided below under "Trading Activities."

Information about the market risk associated with our non-trading activities, which consists primarily of interest rate risk, is provided below under "Asset-and-Liability Management Activities."

Trading Activities

In the conduct of our trading activities, we assume market risk, the level of which is a function of our overall risk appetite, business objectives and liquidity needs, our clients' requirements and market volatility and our execution against those factors.

We engage in trading activities primarily to support our clients' needs and to contribute to our overall corporate earnings and liquidity. In connection with certain of these trading activities, we enter into a variety of derivative financial instruments to support our clients' needs and to manage our interest rate and currency risk. These activities are generally intended to generate foreign exchange trading services revenue and to manage potential earnings volatility. In addition, we provide services related to derivatives in our role as both a manager and a servicer of financial assets.

Our clients use derivatives to manage the financial risks associated with their investment goals and business activities. With the growth of cross-border investing, our clients often enter into foreign exchange forward contracts to convert currency for international investments and to manage the currency risk in their international investment portfolios. As an active participant in the foreign exchange markets, we provide foreign exchange forward and option contracts in support of these client needs, and also act as a dealer in the currency markets.

As part of our trading activities, we assume positions in the foreign exchange and interest rate markets by buying and selling cash instruments and entering into derivative instruments, including foreign exchange forward contracts, foreign exchange and interest rate options and interest rate swaps, interest rate forward contracts and interest rate futures. As of December 31, 2018, the notional amount of these derivative contracts was \$2.26 trillion, of which \$2.24 trillion was composed of foreign exchange forward, swap and spot contracts. We seek to match positions

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closely with the objective of minimizing related currency and interest rate risk. All foreign exchange contracts are valued daily at current market rates.

Governance

Our assumption of market risk in our trading activities is an integral part of our corporate risk appetite. Our Board reviews and oversees our management of market risk, including the approval of key market risk policies and the receipt and review of regular market risk reporting, as well as periodic updates on selected market risk topics. The previously described TMRC (refer to "Risk Committees") oversees all market risk-taking activities across our business associated with trading. The TMRC, which reports to MRAC, is composed of members of ERM, our global markets business and our Global Treasury group, as well as our senior executives who manage our trading businesses and other members of management who possess specialized knowledge and expertise. The TMRC meets regularly to monitor the management of our trading market risk activities.

Our business units identify, actively manage and are responsible for the market risks inherent in their businesses. A dedicated market risk management group within ERM, and other groups within ERM, work with those business units to assist them in the identification, assessment, monitoring, management and control of market risk, and assist business unit managers with their market risk management and measurement activities. ERM provides an additional line of oversight, support and coordination designed to promote the consistent identification, measurement and management of market risk across business units, separate from those business units' discrete activities.

The ERM market risk management group is responsible for the management of corporate-wide market risk, the monitoring of key market risks and the development and maintenance of market risk management policies, guidelines and standards aligned with our corporate risk appetite. This group also establishes and approves market risk tolerance limits and trading authorities based on, but not limited to, measures of notional amounts, sensitivity, VaR and stress. Such limits and authorities are specified in our trading and market risk guidelines which govern our management of trading market risk.

Corporate Audit separately assesses the design and operating effectiveness of the market risk controls within our business units and ERM. Other related responsibilities of Corporate Audit include the periodic review of ERM and business unit compliance with market risk policies, guidelines and corporate standards, as well as relevant regulatory requirements. We are subject to regular monitoring, reviews and supervisory exams of our market risk function by the

Federal Reserve. In addition, we are regulated by, among others, the SEC, the Financial Industry Regulatory Authority and the U.S. Commodities Futures Trading Commission.

Risk Appetite

Our corporate market risk appetite is specified in policy statements that outline the governance, responsibilities and requirements surrounding the identification, measurement, analysis, management and communication of market risk arising from our trading activities. These policy statements also set forth the market risk control framework to monitor, support, manage and control this portion of our risk appetite. All groups involved in the management and control of market risk associated with trading activities are required to comply with the qualitative and quantitative elements of these policy statements. Our trading market risk control framework is composed of the following components:

- A trading market risk management process led by ERM, separate from the business units' discrete activities;
- Clearly defined responsibilities and authorities for the primary groups involved in trading market risk management;
- A trading market risk measurement methodology that captures correlation effects and allows aggregation of market risk across risk types, markets and business lines;
- Daily monitoring, analysis and reporting of market risk exposures associated with trading activities against market risk limits;
- A defined limit structure and escalation process in the event of a market risk limit excess;
- Use of VaR models to measure the one-day market risk exposure of trading positions;
- Use of VaR as a ten-day-based regulatory capital measure of the market risk exposure of trading positions;

• Use of non-VaR-based limits and other controls;

• Use of stressed-VaR models, stress-testing analysis and scenario analysis to support the trading market risk measurement and management process by assessing how portfolios and global business lines perform under extreme market conditions;

• Use of back-testing as a diagnostic tool to assess the accuracy of VaR models and other risk management techniques; and

• A new product approval process that requires market risk teams to assess trading-related market risks and apply risk tolerance limits to

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proposed new products and business activities.

We use our CAP to assess our overall capital and liquidity in relation to our risk profile and provide a comprehensive strategy for maintaining appropriate capital and liquidity levels. With respect to market risk associated with trading activities, our risk management and our calculations of regulatory capital are based primarily on our internal VaR models and stress testing analysis. As discussed in detail under "Value-at-Risk" below, VaR is measured daily by ERM. The TMRC oversees our market risk exposure in relation to limits established within our risk appetite framework. These limits define threshold levels for VaR- and stressed VaR-based measures and are applicable to all trading positions subject to regulatory capital requirements. These limits are designed to prevent any undue concentration of market risk exposure, in light of the primarily non-proprietary nature of our trading activities. The risk appetite framework and associated limits are reviewed and approved by the Board's RC.

Covered Positions

Our trading positions are subject to regulatory market risk capital requirements if they meet the regulatory definition of a "covered position." A covered position is generally defined by U.S. banking regulators as an on- or off-balance sheet position associated with the organization's trading activities that is free of any restrictions on its tradability, but does not include intangible assets, certain credit derivatives recognized as guarantees and certain equity positions not publicly traded. All FX and commodity positions are considered covered positions, regardless of the accounting treatment they receive. The identification of covered positions for inclusion in our market risk capital framework is governed by our covered positions policy, which outlines the standards we use to determine whether a trading position is a covered position.

Our covered positions consist primarily of the trading portfolios held by our global markets business. They also arise from certain positions held by our Global Treasury group. These trading positions include products such as foreign exchange spot, foreign exchange forwards, non-deliverable forwards, foreign exchange options, foreign exchange funding swaps, currency futures, financial futures and interest rate futures. New activities are analyzed to determine if the positions arising from such new activities meet the definition of a covered position and conform to our covered positions policy. This documented analysis, including any decisions with respect to market risk treatments, must receive approval from the TMRC.

We use spot rates, forward points, yield curves and discount factors imported from third-party sources to measure the value of our covered positions, and we use such values to mark our covered positions to market

on a daily basis. These values are subject to separate validation by us in order to evaluate reasonableness and consistency with market experience. The mark-to-market gain or loss on spot transactions is calculated by applying the spot rate to the foreign currency principal and comparing the resultant base currency amount to the original transaction principal. The mark-to-market gain or loss on a forward foreign exchange contract or forward cash flow contract is determined as the difference between the life-to-date (historical) value of the cash flow and the value of the cash flow at the inception of the transaction. The mark-to-market gain or loss on interest rate swaps is determined by discounting the future cash flows from each leg of the swap transaction.

Value-at-Risk and Stressed VaR

We use a variety of risk measurement tools and methodologies, including VaR, which is an estimate of potential loss for a given period within a stated statistical confidence interval. We use a risk measurement methodology to measure trading-related VaR daily. We have adopted standards for measuring trading-related VaR, and we maintain regulatory capital for market risk associated with our trading activities in conformity with currently applicable bank regulatory market risk requirements.

We utilize an internal VaR model to calculate our regulatory market risk capital requirements. We use a historical simulation model to calculate daily VaR- and stressed VaR-based measures for our covered positions in conformity with regulatory requirements. Our VaR model seeks to capture identified material risk factors associated with our covered positions, including risks arising from market movements such as changes in foreign exchange rates, interest rates and option-implied volatilities.

We have adopted standards and guidelines to value our covered positions which govern our VaR- and stressed VaR-based measures. Our regulatory VaR-based measure is calculated based on historical volatilities of market risk factors during a two-year observation period calibrated to a one-tail, 99% confidence interval and a ten-business-day holding period. We also use the same platform to calculate a one-tail, 99% confidence interval, one-business-day VaR for internal risk management purposes. A 99% one-tail confidence interval implies that daily trading losses are not expected to exceed the estimated VaR more than 1% of the time, or less than three business days out of a year. Our market risk models, including our VaR model, are subject to change in connection with the governance, validation and back-testing processes described below. These models can change as a result of changes in our business activities, our historical experiences, market forces and events, regulations and

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regulatory interpretations and other factors. In addition, the models are subject to continuing regulatory review and approval. Changes in our models may result in changes in our measurements of our market risk exposures, including VaR, and related measures, including regulatory capital. These changes could result in material changes in those risk measurements and related measures as calculated and compared from period to period.

We calculate a stressed VaR-based measure using the same model we use to calculate VaR, but with model inputs calibrated to historical data from a range of continuous twelve-month periods that reflect significant financial stress. The stressed VaR model is designed to identify the second-worst outcome occurring in the worst continuous one-year rolling period since July 2007. This stressed VaR meets the regulatory requirement as the rolling ten-day period with an outcome that is worse than 99% of other outcomes during that twelve-month period of financial stress. For each portfolio, the stress period is determined algorithmically by seeking the one-year time horizon that produces the largest ten-business-day VaR from within the available historical data. This historical data set includes the financial crisis of 2008, the highly volatile period surrounding the Eurozone sovereign debt crisis and the Standard & Poor's downgrade of U.S. Treasury debt in August 2011. As the historical data set used to determine the stress period expands over time, future market stress events will be incorporated.

Value-at-Risk Measures

VaR measures are based on the most recent two years of historical price movements for instruments and related risk factors to which we have exposure. The instruments in question are limited to foreign exchange spot, forward and options contracts and interest rate contracts, including futures and interest rate swaps. Historically, these instruments have exhibited a higher degree of liquidity relative to other available capital markets instruments. As a result, the VaR measures shown reflect our ability to rapidly adjust exposures in highly dynamic markets. For this reason, risk inventory, in the form of net open positions, across all currencies is typically limited. In addition, long and short positions in major, as well as minor, currencies provide risk offsets that limit our potential downside exposure. Our VaR methodology uses a historical simulation approach based on market-observed changes in foreign exchange rates, U.S. and non-U.S. interest rates and implied volatilities, and incorporates the resulting diversification benefits provided from the mix of our trading positions. Our VaR model incorporates approximately 5,000 risk factors and includes correlations among currency, interest rates and other market rates.

All VaR measures are subject to limitations and must be interpreted accordingly. Some, but not all, of the limitations of our VaR methodology include the following:

- Compared to a shorter observation period, a two-year observation period is slower to reflect increases in market volatility (although temporary increases in market volatility will affect the calculation of VaR for a longer period); consequently, in periods of sudden increases in volatility or increasing volatility, in each case relative to the prior two-year period, the calculation of VaR may understate current risk;

Compared to a longer observation period, a two-year observation period may not reflect as many past periods of volatility in the markets, because such past volatility is no longer in the observation period; consequently, historical market scenarios of high volatility, even if similar to current or likely future market circumstances, may fall outside the two-year observation period, resulting in a potential understatement of current risk;

- The VaR-based measure is calibrated to a specified level of confidence and does not indicate the potential magnitude of losses beyond this confidence level;

In certain cases, VaR-based measures approximate the impact of changes in risk factors on the values of positions and portfolios; this may happen because the number of inputs included in the VaR model is necessarily limited; for example, yield curve risk factors do not exist for all future dates;

- The use of historical market information may not be predictive of future events, particularly those that are extreme in nature; this "backward-looking" limitation can cause VaR to understate or overstate risk;

The effect of extreme and rare market movements is difficult to estimate; this may result from non-linear risk sensitivities as well as the potential for actual volatility and correlation levels to differ from assumptions implicit in the VaR calculations; and

Intra-day risk is not captured.

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Stress Testing

We have a corporate-wide stress testing program in place that incorporates an array of techniques to measure the potential loss we could suffer in a hypothetical scenario of adverse economic and financial conditions. We also monitor concentrations of risk such as concentration by branch, risk component, and currency pairs. We conduct stress testing on a daily basis based on selected historical stress events that are relevant to our positions in order to estimate the potential impact to our current portfolio should similar market conditions recur, and we also perform stress testing as part of the Federal Reserve's CCAR process. Stress testing is conducted, analyzed and reported at the corporate, trading desk, division and risk-factor level (for example, exchange risk, interest rate risk and volatility risk).

Stress testing results and limits are actively monitored on a daily basis by ERM and reported to the TMRC. Limit breaches are addressed by ERM risk managers in conjunction with the business units, escalated as appropriate, and reviewed by the TMRC if material. In addition, we have established several action triggers that prompt immediate review by management and the implementation of a remediation plan.

We perform scenario analysis daily based on selected historical stress events that are relevant to our positions in order to estimate the potential impact to our current portfolio should similar market conditions recur. Relevant scenarios are chosen from an inventory of historical financial stresses and applied to our current portfolio. These historical event scenarios involve spot foreign exchange, credit, equity, unforeseen geo-political events and natural disasters, and government and central bank intervention scenarios. Examples of the specific historical scenarios we incorporate in our stress testing program may include the Asian financial crisis of 1997, the September 11, 2001 terrorist attacks in the U.S. and the 2008 financial crisis. We continue to update our inventory of historical stress scenarios as new stress conditions emerge in the financial markets.

As each of the historical stress events is associated with a different time horizon, we normalize results by scaling down the longer horizon events to a ten-day horizon and keeping the shorter horizon events (i.e., events that are shorter than ten days) at their original terms. We also conduct sensitivity analysis daily to calculate the impact of a large predefined shock in a specific risk factor or a group of risk factors on our current portfolio. These predefined shocks include parallel and non-parallel yield curve shifts and foreign exchange spot and volatility surface shifts. In a parallel shift scenario, we apply a constant factor shift across all yield curve tenors. In a non-parallel shift scenario, we apply different shock levels to different tenors of a

yield curve, rather than shifting the entire curve by a constant amount. Non-parallel shifts include steepening, flattening and butterflies.

Validation and Back-Testing

We perform frequent back-testing to assess the accuracy of our VaR-based model in estimating loss at the stated confidence level. This back-testing involves the comparison of estimated VaR model outputs to daily, actual profit-and-loss (P&L) outcomes observed from daily market movements. We back-test our VaR model using "clean" P&L, which excludes non-trading revenue such as fees, commissions and NII, as well as estimated revenue from intra-day trading.

Our VaR definition of trading losses excludes items that are not specific to the price movement of the trading assets and liabilities themselves, such as fees, commissions, changes to reserves and gains or losses from intra-day activity. We experienced three back-testing exceptions in 2018 and one each in 2017 and 2016. The three back-testing exceptions in 2018 occurred in the last four months of the year when the markets experienced an abrupt increase in volatility. The heightened volatility follows several years of relatively benign market conditions that saw the VIX routinely register as little as 10% or less. Following such periods, it is quite common for VaR models calibrated to the most recent two years of data to underestimate the trading gains or losses that are experienced as volatility trends above levels that were seen more recently. In reference to the 2017 exception, the trading loss that day exceeded the VaR based on the prior day's closing positions, following the euro's forward point spike on short tenors driven by thinning liquidity and reduced volumes spurred by banks' year-end balance sheet preparations. In reference to the 2016 exception, the trading P&L that day exceeded the VaR based on the prior day's closing positions, following a large

depreciation in the U.S. dollar against several major and emerging market currencies, primarily attributable to U.S. GDP growth rate being lower than expected and market reaction to Bank of Japan's decision to leave the interest rate unchanged.

Our model validation process also evaluates the integrity of our VaR models through the use of regular outcome analysis. This outcome analysis includes back-testing, which compares the VaR model's predictions to actual outcomes using out-of-sample information. Consistent with regulatory guidance, the back-testing compared "clean" P&L, defined above, with the one-day VaR produced by the model. The back-testing was performed for a time period not used for model development. The number of occurrences where "clean" trading-book P&L exceeded the one-day VaR was within our expected VaR tolerance level.

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Market Risk Reporting

Our ERM market risk management group is responsible for market risk monitoring and reporting. We use a variety of systems and controlled market feeds from third-party services to compile data for several daily, weekly and monthly management reports.

The following tables present VaR and stressed VaR associated with our trading activities for covered positions held during the years ended December 31, 2018 and 2017, respectively, as measured by our VaR methodology.

Diversification effect in the tables below represents the difference between total VaR and the sum of the VaRs for each trading activity. This effect arises because the risks present in our trading activities are not perfectly correlated.

TABLE 32: TEN-DAY VaR ASSOCIATED WITH TRADING ACTIVITIES FOR COVERED POSITIONS

(In thousands)	Year Ended December 31, 2018				Year Ended December 31, 2017			
	Year Ended	Average	Maximum	Minimum	Year Ended	Average	Maximum	Minimum
Global Markets	\$10,588	\$7,354	\$19,160	\$2,967	\$5,719	\$7,532	\$16,160	\$2,566
Global Treasury	1,354	750	3,579	91	1,346	517	1,767	89
Diversification	(1,435)	(634)	(3,348)	205	(1,503)	(544)	(1,808)	(111)
Total VaR	\$10,507	\$7,470	\$19,391	\$3,263	\$5,562	\$7,505	\$16,119	\$2,544

TABLE 33: TEN-DAY STRESSED VaR ASSOCIATED WITH TRADING ACTIVITIES FOR COVERED POSITIONS

(In thousands)	Year Ended December 31, 2018				Year Ended December 31, 2017			
	Year Ended	Average	Maximum	Minimum	Year Ended	Average	Maximum	Minimum
Global Markets	\$26,512	\$32,744	\$58,221	\$14,811	\$31,512	\$27,366	\$45,399	\$13,363
Global Treasury	7,683	3,659	10,177	342	12,042	7,430	17,460	1,321
Diversification	(7,919)	(4,101)	(10,179)	(325)	(13,905)	(6,334)	(15,964)	(797)
Total Stressed VaR	\$26,276	\$32,302	\$58,219	\$14,828	\$29,649	\$28,462	\$46,895	\$13,887

The average of our stressed VaR-based measure was approximately \$32 million for the year ended December 31, 2018, compared to an average of approximately \$28 million for the year ended December 31, 2017.

While the average stressed VaR-based measure increased, the decrease in our stressed VaR-based measure at year end was mainly driven by lower end of day foreign exchange positions and reduced basis risk exposure in Korean Won forward rates as of December 31, 2018 compared to December 31, 2017.

The VaR-based measures presented in the preceding tables are primarily a reflection of the overall level of market volatility and our appetite for taking market risk in our trading activities. Overall levels of volatility have been low both on an absolute basis and relative to the historical information observed at the beginning of the period used for the calculations. Both the ten-day VaR-based measures and the stressed VaR-based measures are based on historical changes observed during rolling ten-day periods for the portfolios as of the close of business each day over the past one-year period.

We may in the future modify and adjust our models and methodologies used to calculate VaR and stressed VaR, subject to regulatory review and approval, and these modifications and adjustments may result in changes in our VaR-based and stressed VaR-based measures.

The following tables present the VaR and stressed-VaR associated with our trading activities attributable to foreign exchange risk, interest rate risk and volatility risk as of December 31, 2018 and 2017, respectively. The totals of the VaR-based and stressed VaR-based measures for the three attributes in total exceeded the related total VaR and total stressed VaR presented in the foregoing tables as of each period-end, primarily due to the benefits of diversification

across risk types. Diversification effect in the tables below represents the difference between total VaR and the sum of the VaRs for each trading activity. This effect arises because the risks present in our trading activities are not perfectly correlated.

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TABLE 34: TEN-DAY VaR ASSOCIATED WITH TRADING ACTIVITIES BY RISK FACTOR⁽¹⁾

(In thousands)	As of December 31, 2018 ⁽²⁾		As of December 31, 2017		
	Foreign Exchange Risk	Interest Rate Risk	Foreign Exchange Risk	Interest Rate Risk	Volatility Risk
By component:					
Global Markets	\$2,679	\$11,850	\$6,149	\$5,546	\$ 3
Global Treasury	53	1,377	100	1,372	—
Diversification	(39)	(1,436)	1	(1,078)	—
Total VaR	\$2,693	\$11,791	\$6,250	\$5,840	\$ 3

TABLE 35: TEN-DAY STRESSED VaR ASSOCIATED WITH TRADING ACTIVITIES BY RISK FACTOR⁽¹⁾

(In thousands)	As of December 31, 2018 ⁽²⁾		As of December 31, 2017		
	Foreign Exchange Risk	Interest Rate Risk	Foreign Exchange Risk	Interest Rate Risk	Volatility Risk
By component:					
Global Markets	\$10,465	\$23,324	\$15,975	\$27,161	\$ 3
Global Treasury	74	8,202	153	12,192	—
Diversification	(132)	(7,835)	(23)	(14,176)	—
Total Stressed VaR	\$10,407	\$23,691	\$16,105	\$25,177	\$ 3

⁽¹⁾ For purposes of risk attribution by component, foreign exchange refers only to the risk from market movements in period-end rates. Forwards, futures, options and swaps with maturities greater than period-end have embedded interest rate risk that is captured by the measures used for interest rate risk. Accordingly, the interest rate risk embedded in these foreign exchange instruments is included in the interest rate risk component.

⁽²⁾ As of December 31, 2018, we had no ten-day VaR or ten-day stressed VaR associated with volatility risk.

Asset and Liability Management Activities

The primary objective of asset and liability management is to provide sustainable NII under varying economic conditions, while protecting the economic value of the assets and liabilities carried in our consolidated statement of condition from the adverse effects of changes in interest rates. While many market factors affect the level of NII and the economic value of our assets and liabilities, one of the most significant factors is our exposure to movements in interest rates. Most of our NII is earned from the investment of client deposits generated by our businesses. We invest these client deposits in assets that conform generally to the characteristics of our balance sheet liabilities, including the currency composition of our significant non-U.S. dollar denominated client liabilities.

We quantify NII sensitivity using an earnings simulation model that includes our expectations for new business growth, changes in balance sheet mix and investment portfolio positioning. This measure compares our baseline view of our NII over a twelve-month horizon, based on our internal forecast of interest rates, to a wide range of instantaneous and gradual rate shocks. EVE sensitivity is a discounted cash flow model designed to estimate fair value of assets and liabilities under a series of interest rate shocks over a long-term horizon. Each approach is routinely monitored as market conditions change.

In the table below, we report the expected change in NII over the next twelve months from +/-100 bps instantaneous and gradual parallel rate shocks. Each scenario assumes no management action is taken to mitigate the adverse effects of interest rate changes on our financial performance. While investment securities balances can fluctuate with the level

of rates as

prepayment assumptions change, our deposit balances remain consistent with the baseline.

TABLE 36: NII
SENSITIVITY

	December	
	31,	
(In millions)	2018	2017
Rate change:	Benefit	
	(Exposure)	
+100 bps shock	\$371	\$435
-100 bps shock	(183)	(294)
+100 bps ramp	148	177
-100 bps ramp	(72)	(122)

As of December 31, 2018, NII sensitivity remains positioned to benefit from rising interest rates. Compared to December 31, 2017, our asset sensitive positioning to an instantaneous rise in rates is less sensitive, primarily driven by an increase in U.S. client deposit betas as a result of higher market rates.

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We also routinely measure NII sensitivity to non-parallel rate shocks to isolate the impact of short-term or long-term market rates. In the up 100 bps instantaneous shock, approximately 70% of the expected benefit stems from the short-end of the yield curve. Additionally, we quantify how much of the change is a result of shifts in U.S. and non-U.S. rates. In the up 100 bps instantaneous shock, approximately 30-40% of the benefit is driven by U.S. rates. The following table highlights our EVE sensitivity to a +/-200 bps instantaneous rate shock, relative to spot interest rates. Management compares the change in EVE sensitivity against our aggregate tier 1 and tier 2 risk-based capital, calculated in conformity with current applicable regulatory requirements. EVE sensitivity is dependent on the timing of interest and principal cash flows. Also, the measure only evaluates the spot balance sheet and does not include the impact of new business assumptions.

TABLE 37: EVE SENSITIVITY

	December 31,	
(In millions)	2018	2017
Rate change:	Benefit (Exposure)	
+200 bps shock	\$(1,603)	\$(1,507)
-200 bps shock	796	11

As of December 31, 2018, EVE sensitivity remains exposed to upward shifts in interest rates. Compared to December 31, 2017, the change in the up 200 bps instantaneous shock was driven by higher U.S. interest rates and a mix shift in client deposits to more floating-rate, reducing deposit duration. The change in the down 200 bps instantaneous shock was primarily due to a modeling enhancement for negative rate currencies. The modeling enhancement allows for interest rate shocks to go below zero for certain currencies, such as Euro, where central banks have allowed negative rates. The December 31, 2017 benefit, which does not reflect the modeling enhancement, in the down 200 bps shock would have increased approximately \$1 billion under the new modeling approach.

This update aligns our modeling approaches for negative rates in both EVE and NII sensitivity simulations.

Model Risk Management

The use of models is widespread throughout the financial services industry, with large and complex organizations relying on sophisticated models to support numerous aspects of their financial decision making. The models contemporaneously represent both a significant advancement in financial management and a source of risk. In large banking organizations like us, model results influence business decisions, and model failure could have a harmful effect on our financial performance. As a result, the Model Risk Management Framework seeks to mitigate our model risk.

Our model risk management program has three principal components:

- A model risk governance program that defines roles and responsibilities, including the authority to restrict model usage, provides policies and guidance, monitors compliance and reports regularly to the Board on the overall degree of model risk across the corporation;

- A model development process that focuses on sound design and computational accuracy, and includes activities designed to test for robustness, stability and sensitivity to assumptions; and

- An independent model validation function designed to verify that models are conceptually sound, computationally accurate, are performing as expected, and are in line with their design objectives.

Governance

Models used in the regulatory capital calculation can only be deployed for use after undergoing a model validation by ERM's Model Risk Management and receiving the result on the validation that allows for use or is permitted to be used by the MRC.

ERM's Model Risk Management group is responsible for defining the corporate-wide model risk governance framework, and maintains policies and guidelines that achieve the framework's objectives. The team is responsible for overall model risk governance capabilities, with particular emphasis in the areas of model validation, model risk reporting, model performance monitoring, tracking of new model development status and committee-level review and

challenge.

MRC, which is composed of senior staff with technical expertise, reports to MRAC, and provides guidance and oversight to the Model Risk Management function.

Model Development and Usage

Models are developed under standards governing data sourcing, methodology selection and model integrity testing.

Model development includes a

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statement of purpose to align development with intended use. It also includes a comparison of alternative approaches to promote a sound modeling approach.

Model developers conduct an assessment of data quality and relevance. The development teams conduct a variety of tests of the accuracy, robustness and stability of each model.

Model owners submit models to the Model Validation Group for validation on a regular basis, as per existing policy.

Model Validation

MVG is part of Model Risk Management within ERM and performs model validations. MVG is independent, as contemplated by applicable bank regulatory requirements, of both the developers and users of the models. MVG validates models through a review process that assesses the appropriateness, accuracy, and suitability of data inputs, methodologies, assumptions, and processing code. Model validation also encompasses an assessment of model performance, sensitivity, and robustness, as well as a model's potential limitations given its particular assumptions or deficiencies. Based on the results of its review, MVG issues a model use decision and may require remedial actions and/or compensating controls on model use. MVG also maintains a model risk rating system, which assigns a risk rating to each model based on an assessment of a model's inherent and residual risks. These ratings aid in the understanding and reporting of model risk across the model portfolio, and enable the triaging of needs for remediation. If a model owner disagrees with the results of a validation or any other aspect of model risk, they are permitted to raise the issue with the MRC for resolution.

Strategic Risk Management

We define strategic risk as the current or prospective impact on earnings or capital arising from adverse business decisions, improper implementation of strategic initiatives, or lack of responsiveness to industry-wide changes. Strategic risks are influenced by changes in the competitive environment; decline in market performance or changes in our business activities; and the potential secondary impacts of reputational risks, not already captured as market, interest rate, credit, operational, model or liquidity risks. We incorporate strategic risk into our assessment of our business plans and risk and capital management processes. Active management of strategic risk is an integral component of all aspects of our business.

Separating the effects of a potential material adverse event into operational and strategic risk is sometimes difficult. For instance, the direct financial impact of an unfavorable event in the form of fines or penalties would be classified as an operational risk loss, while the impact on our reputation and consequently

the potential loss of clients and corresponding decline in revenue would be classified as a strategic risk loss. An additional example of strategic risk is the integration of a major acquisition. Failure to successfully integrate the operations of an acquired business, and the resultant inability to retain clients and the associated revenue, would be classified as a loss due to strategic risk.

Strategic risk is managed with a long-term focus. Techniques for its assessment and management include the development of business plans, which are subject to robust review and challenge from senior management and the Board of Directors, as well as a formal review and approval process for all new business and product proposals. The potential impact of the various elements of strategic risk is difficult to quantify with any degree of precision. We use a combination of historical earnings volatility, scenario analysis, stress-testing and management judgment to help assess the potential effect on us attributable to strategic risk. Management and control of strategic risks are generally the responsibility of the business units, with oversight from the control functions, as part of their overall strategic planning and internal risk management processes.

Capital

Managing our capital involves evaluating whether our actual and projected levels of capital are commensurate with our risk profile, are in compliance with all applicable regulatory requirements and are sufficient to provide us with the financial flexibility to undertake future strategic business initiatives. We assess capital adequacy based on relevant regulatory capital requirements, as well as our own internal capital goals, targets and other relevant metrics.

Framework

Our objective with respect to management of our capital is to maintain a strong capital base in order to provide financial flexibility for our business needs, including funding corporate growth and supporting clients' cash management needs, and to provide protection against loss to depositors and creditors. We strive to maintain an appropriate level of capital, commensurate with our risk profile, on which an attractive return to shareholders is expected to be realized over both the short and long-term, while protecting our obligations to depositors and creditors and complying with regulatory capital requirements.

Our capital management focuses on our risk exposures, the regulatory requirements applicable to us with respect to multiple capital measures, the evaluations and resulting credit ratings of the major independent rating agencies, our return on capital at both the consolidated and line-of-business level and our capital position relative to our peers.

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Assessment of our overall capital adequacy includes the comparison of capital sources with capital uses, as well as the consideration of the quality and quantity of the various components of capital. The assessment seeks to determine the optimal level of capital and composition of capital instruments to satisfy all constituents of capital, with the lowest overall cost to shareholders. Other factors considered in our assessment of capital adequacy are strategic and contingency planning, stress testing and planned capital actions.

Capital Adequacy Process

Our primary federal banking regulator is the Federal Reserve. Both we and State Street Bank are subject to the minimum regulatory capital requirements established by the Federal Reserve and defined in FDICIA. State Street Bank must exceed the regulatory capital thresholds for "well capitalized" in order for our Parent Company to maintain its status as a financial holding company. Accordingly, one of our primary goals with respect to capital management is to exceed all applicable minimum regulatory capital requirements and to be "well-capitalized" under the PCA guidelines established by the FDIC. Our capital management activities are conducted as part of our corporate-wide CAP and associated Capital Policy and guidelines.

We consider capital adequacy to be a key element of our financial well-being, which affects our ability to attract and maintain client relationships; operate effectively in the global capital markets; and satisfy regulatory, security holder and shareholder needs. Capital is one of several elements that affect our credit ratings and the ratings of our principal subsidiaries.

In conformity with our Capital Policy and guidelines, we strive to achieve and maintain specific internal capital levels, not just at a point in time, but over time and during periods of stress, to account for changes in our strategic direction, evolving economic conditions and financial and market volatility. We have developed and implemented a corporate-wide CAP to assess our overall capital in relation to our risk profile and to provide a comprehensive strategy for maintaining appropriate capital levels. The CAP considers material risks under multiple scenarios, with an emphasis on stress scenarios, and encompasses existing processes and systems used to measure our capital adequacy.

Capital Contingency Planning

Contingency planning is an integral component of capital management. The objective of contingency planning is to monitor current and forecast levels of select capital, liquidity and other measures that serve as early indicators of a potentially adverse capital or liquidity adequacy situation. These measures are one of the inputs used to set our internal capital adequacy level. We review these measures annually for

appropriateness and relevance in relation to our financial budget and capital plan.

Stress Testing

We administer a robust business-wide stress-testing program that executes multiple stress tests each year to assess the institution's capital adequacy and/or future performance under adverse conditions. Our stress testing program is structured around what we determine to be the key risks incurred by us, as assessed through a recurring material risk identification process. The material risk identification process represents a bottom-up approach to identifying the institution's most significant risk exposures across all on- and off-balance sheet risk-taking activities, including credit, market, liquidity, interest rate, operational, fiduciary, business, reputation and regulatory risks. These key risks serve as an organizing principle for much of our risk management framework, as well as reporting, including the "risk dashboard" provided to the Board. Over the past few years, stress scenarios have included a deep recession in the U.S., a break-up of the Eurozone, a severe recession in China and an oil shock precipitated by turmoil in the Middle East/North Africa region.

In connection with the focus on our key risks, each stress test incorporates idiosyncratic loss events tailored to our unique risk profile and business activities. Due to the nature of our business model and our consolidated statement of condition, our risks differ from those of a traditional commercial bank.

The Federal Reserve requires bank holding companies with total consolidated assets of \$50 billion or more, which includes us, to submit a capital plan on an annual basis. The Federal Reserve uses its annual CCAR process, which incorporates hypothetical financial and economic stress scenarios, to review those capital plans and assess whether

banking organizations have capital planning processes that account for idiosyncratic risks and provide for sufficient capital to continue operations throughout times of economic and financial stress. As part of its CCAR process, the Federal Reserve assesses each organization's capital adequacy, capital planning process and plans to distribute capital, such as dividend payments or stock purchase programs. Management and Board risk committees review, challenge and approve CCAR results and assumptions before submission to the Federal Reserve.

Through the evaluation of our capital adequacy and/or future performance under adverse conditions, the stress testing processes provide important insights for capital planning, risk management and strategic decision-making for us.

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Governance

In order to support integrated decision making, we have identified three management elements to aid in the compatibility and coordination of our CAP:

• Risk Management - identification, measurement, monitoring and forecasting of different types of risk and their combined impact on capital adequacy;

• Capital Management - determination of optimal capital levels; and

• Business Management - strategic planning, budgeting, forecasting and performance management.

We have a hierarchical structure supporting appropriate committee review of relevant risk and capital information.

The ongoing responsibility for capital management rests with our Treasurer. The Capital Management group within Global Treasury is responsible for the Capital Policy and guidelines, development of the Capital Plan, the management of global capital and capital optimization.

MRAC provides oversight of our capital management, our capital adequacy, our internal targets and the expectations of the major independent credit rating agencies. In addition, MRAC approves our balance sheet strategy and related activities. The Board's RC assists the Board in fulfilling its oversight responsibilities related to the assessment and management of risk and capital. Our Capital Policy is reviewed and approved annually by the Board's RC.

Global Systemically Important Bank

We are one among a group of 29 institutions worldwide that have been identified by the FSB and the BCBS as G-SIBs. Our designation as a G-SIB is based on a number of factors, as evaluated by banking regulators, and requires us to maintain an additional capital buffer above the minimum capital ratios set forth in the Basel III final rule.

We and our depository institution subsidiaries are subject to the current Basel III minimum risk-based capital and leverage ratio guidelines. The Basel III final rule incorporates several multi-year transition provisions for capital components and minimum ratio requirements for CET1 capital, tier 1 capital and total capital.

Additional information about G-SIBs is provided under "Regulatory Capital Adequacy and Liquidity Standards" in "Supervision and Regulation" in Business in this Form 10-K.

Regulatory Capital

We and State Street Bank, as advanced approaches banking organizations, are subject to the U.S. Basel III framework. Provisions of the Basel III final rule became effective with full implementation on January 1, 2019. We are also subject to the final market risk capital rule issued by U.S. banking regulators effective as of January 2013.

The Basel III final rule provides for two frameworks for monitoring capital adequacy: the "standardized" approach and the "advanced" approaches, applicable to advanced approaches banking organizations, like us. The standardized approach prescribes standardized calculations for credit RWA, including specified risk weights for certain on- and off-balance sheet exposures.

The advanced approaches consist of the AIRB approach used for the calculation of RWA related to credit risk, and the AMA approach used for the calculation of RWA related to operational risk.

The final market risk capital rule requires us to use internal models to calculate daily measures of VaR, that reflect general market risk for certain of our trading positions defined by the rule as "covered positions," as well as stressed-VaR measures to supplement the VaR measures. The rule also requires a public disclosure composed of qualitative and quantitative information about the market risk associated with our trading activities and our related VaR and stressed-VaR measures. The qualitative and quantitative information required by the rule is provided under "Market Risk" in this Form 10-K.

As required by the Dodd-Frank Act, we and State Street Bank, as advanced approaches banking organizations, are subject to a permanent "capital floor," also referred to as the Collins Amendment, in the assessment of our regulatory capital adequacy, including the capital conservation buffer and countercyclical capital buffer. Our risk-based capital ratios for regulatory assessment purposes are the lower of each ratio calculated under the standardized approach and the advanced approaches.

The requirement for the capital conservation buffer became effective with full implementation on January 1, 2019. Specifically, the final rule limits a banking organization's ability to make capital distributions and discretionary bonus payments to executive officers if it fails to maintain a CET1 capital conservation buffer of more than 2.5% of total RWA and, if deployed during periods of excessive credit growth, a CET1 countercyclical capital buffer of up to 2.5% of total RWA, above each of the minimum CET1, tier 1, and total risk-based capital ratios. The countercyclical capital buffer is currently set at zero by U.S. banking regulators.

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To maintain the status of the Parent Company as a financial holding company, we and our insured depository institution subsidiaries are required to be "well-capitalized" by maintaining capital ratios above the minimum requirements. Effective on January 1, 2015, the "well-capitalized" standard for our banking subsidiaries was revised to reflect the higher capital requirements in the Basel III final rule.

The following table sets forth the transition to full implementation and the minimum risk-based capital ratio requirements under the Basel III final rule.

TABLE 38: BASEL III FINAL RULES TRANSITION ARRANGEMENTS AND MINIMUM RISK-BASED CAPITAL RATIOS⁽¹⁾

	2019	2018	2017	2016	2015
Capital conservation buffer (CET1)	2.500 %	1.875 %	1.250 %	0.625 %	— %
G-SIB surcharge (CET1) ⁽²⁾	1.500	1.125	0.750	0.375	—
Minimum CET1 ⁽³⁾	8.500	7.500	6.500	5.500	4.500
Minimum tier 1 capital ⁽³⁾	10.000	9.000	8.000	7.000	6.000
Minimum total capital ⁽³⁾	12.000	11.000	10.000	9.000	8.000

⁽¹⁾ Minimum ratios shown above do not reflect the countercyclical buffer, currently set at zero by U.S. banking regulators.

⁽²⁾ As part of the G-SIB Surcharge final rule, the Federal Reserve published estimated G-SIB surcharges for the eight U.S. G-SIBs. The estimated resulting G-SIB surcharge for us is 1.5%.

⁽³⁾ Minimum CET1 capital, minimum tier 1 capital and minimum total capital presented include the transitional capital conservation buffer as well as the estimated transitional G-SIB surcharge that were phased-in beginning January 1, 2016 through January 1, 2019 based on an estimated 1.5% surcharge in all periods.

The specific calculation of our and State Street Bank's risk-based capital ratios changed as the provisions of the Basel III final rule related to the numerator (capital) and denominator (RWA) were phased in, and as our RWA calculated using the advanced approaches changed due to changes in methodology. These methodological changes result in differences in our reported capital ratios from one reporting period to the next that are independent of applicable changes to our capital base, our asset composition, our off-balance sheet exposures or our risk profile.

The following table presents the regulatory capital structure and related regulatory capital ratios for us and State Street Bank as of the dates indicated. We are subject to the more stringent of the risk-based capital ratios calculated under the standardized approach and those calculated under the advanced approaches in the assessment of our capital adequacy under applicable bank regulatory standards.

As a result of changes in the methodologies used to calculate our regulatory capital ratios from period to period, as the provisions of the Basel III final rule were phased in, the ratios presented in the table for each period are not directly comparable. Refer to the footnotes following the table.

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TABLE 39: REGULATORY CAPITAL STRUCTURE AND RELATED REGULATORY CAPITAL RATIOS

(In millions)	State Street				State Street Bank			
	Basel III Advanced Approaches December 31, 2018	Basel III Standardized Approach December 31, 2018	Basel III Advanced Approaches December 31, 2017	Basel III Standardized Approach December 31, 2017	Basel III Advanced Approaches December 31, 2018	Basel III Standardized Approach December 31, 2018	Basel III Advanced Approaches December 31, 2017	Basel III Standardized Approach December 31, 2017
Common shareholders' equity:								
Common stock and related surplus	\$10,565	\$10,565	\$10,302	\$10,302	\$12,894	\$12,894	\$11,612	\$11,612
Retained earnings	20,606	20,606	18,856	18,856	14,261	14,261	12,312	12,312
Accumulated other comprehensive income (loss)	(1,332)	(1,332)	(972)	(972)	(1,112)	(1,112)	(809)	(809)
Treasury stock, at cost	(8,715)	(8,715)	(9,029)	(9,029)	—	—	—	—
Total	21,124	21,124	19,157	19,157	26,043	26,043	23,115	23,115
Regulatory capital adjustments:								
Goodwill and other intangible assets, net of associated deferred tax liabilities ⁽¹⁾	(9,350)	(9,350)	(6,877)	(6,877)	(9,073)	(9,073)	(6,579)	(6,579)
Other adjustments ⁽²⁾	(194)	(194)	(76)	(76)	(29)	(29)	(5)	(5)
CET1 capital	11,580	11,580	12,204	12,204	16,941	16,941	16,531	16,531
Preferred stock	3,690	3,690	3,196	3,196	—	—	—	—
Trust preferred capital securities subject to phase-out from tier 1 capital	—	—	—	—	—	—	—	—
Other adjustments	—	—	(18)	(18)	—	—	—	—
Tier 1 capital	15,270	15,270	15,382	15,382	16,941	16,941	16,531	16,531
Qualifying subordinated long-term debt	778	778	980	980	776	776	983	983
Trust preferred capital securities phased out of tier 1 capital	—	—	—	—	—	—	—	—
ALLL and other	14	83	4	72	11	83	—	72
Other adjustments	—	—	1	1	—	—	—	—
Total capital RWA:	\$16,062	\$16,131	\$16,367	\$16,435	\$17,728	\$17,800	\$17,514	\$17,586
Credit risk ⁽³⁾	\$47,738	\$97,303	\$52,000	\$101,349	\$45,565	\$94,776	\$49,489	\$98,433
Operational risk ⁽⁴⁾	46,060	NA	45,822	NA	44,494	NA	45,295	NA

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Market risk	1,517	1,517	1,334	1,334	1,517	1,517	1,334	1,334
Total RWA	\$95,315	\$98,820	\$99,156	\$102,683	\$91,576	\$96,293	\$96,118	\$99,767
Adjusted quarterly average assets	\$211,924	\$211,924	\$209,328	\$209,328	\$209,413	\$209,413	\$206,070	\$206,070

	2018	2017									
Minimum Requirements Including Capital Ratios: Conservation Buffer and G-SIB Surcharge ⁽⁶⁾											
CET1 capital	7.5 %	6.5 %	12.1 %	11.7 %	12.3 %	11.9 %	18.5 %	17.6 %	17.2 %	16.6 %	%
Tier 1 capital	9.0	8.0	16.0	15.5	15.5	15.0	18.5	17.6	17.2	16.6	
Total capital	11.0	10.0	16.9	16.3	16.5	16.0	19.4	18.5	18.2	17.6	

(1) Amounts for us and State Street Bank as of December 31, 2018 consisted of goodwill, net of associated deferred tax liabilities, and 100% of other intangible assets, net of associated deferred tax liabilities. Amounts for us and State Street Bank as of December 31, 2017 consisted of goodwill, net of associated deferred tax liabilities and 80% of other intangible assets, net of associated deferred tax liabilities. Intangible assets, net of associated deferred tax liabilities is phased in as a deduction from capital, in conformity with the Basel III final rule.

(2) Other adjustments within CET1 capital primarily include the overfunded portion of our defined benefit pension plan obligation net of associated deferred tax liabilities, disallowed deferred tax assets, and other required credit risk based deductions.

(3) Includes a CVA which reflects the risk of potential fair value adjustments for credit risk reflected in our valuation of over-the-counter derivative contracts. We used a simple CVA approach in conformity with the Basel III advanced approaches.

(4) Under the current advanced approaches rules and regulatory guidance concerning operational risk models, RWA attributable to operational risk can vary substantially from period-to-period, without direct correlation to the effects of a particular loss event on our results of operations and financial condition and impacting dates and periods that may differ from the dates and periods as of and during which the loss event is reflected in our financial statements, with the timing and categorization dependent on the processes for model updates and, if applicable, model revalidation and regulatory review and related supervisory processes. An individual loss event can have a significant effect on the output of our operational RWA under the advanced approaches depending on the severity of the loss event and its categorization among the seven Basel-defined UOMs.

(5) Minimum requirements were phased in with full implementation beginning on January 1, 2019; minimum requirements listed are as of December 31, 2018. See Table 38: Basel III Final Rules Transition Arrangements and Minimum Risk-Based Capital Ratios.

(6) Minimum requirements were phased in with full implementation beginning on January 1, 2019; minimum requirements listed are as of December 31, 2017. See Table 38: Basel III Final Rules Transition Arrangements and Minimum Risk-Based Capital Ratios.

NA Not applicable

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Our CET1 capital decreased \$0.6 billion as of December 31, 2018 compared to December 31, 2017 primarily driven by goodwill and intangible assets deduction of \$2.2 billion, capital distributions of \$1.2 billion from common and preferred stock dividends and common stock repurchases, accumulated other comprehensive loss of \$0.4 billion and a \$0.3 billion impact from the 2018 phase-in of the deduction of intangible assets (100% in 2018 compared to 80% in 2017), offset by net income of \$2.6 billion for the year ended December 31, 2018 and the issuance of common stock of \$1.2 billion.

In the same comparative period, our tier 1 capital decreased \$0.1 billion and total capital decreased \$0.3 billion under both advanced approaches and standardized approach due to the changes in our CET1 capital offset by the issuance of preferred stock of approximately \$500 million in the third quarter of 2018.

The table below presents a roll-forward of CET1 capital, tier 1 capital and total capital for the year ended December 31, 2018 and for the year ended December 31, 2017.

TABLE 40: CAPITAL ROLL-FORWARD

(In millions)	Basel III	Basel III	Basel III	Basel III
	Advanced Approaches December 31, 2018	Standardized Approach December 31, 2018	Advanced Approaches December 31, 2017	Standardized Approach December 31, 2017
CET1 capital:				
CET1 capital balance, beginning of period	\$ 12,204	\$ 12,204	\$ 11,624	\$ 11,624
Net income	2,599	2,599	2,177	2,177
Changes in treasury stock, at cost	314	314	(1,347)	(1,347)
Dividends declared	(853)	(853)	(778)	(778)
Goodwill and other intangible assets, net of associated deferred tax liabilities	(2,473)	(2,473)	(529)	(529)
Effect of certain items in accumulated other comprehensive income (loss)	(360)	(360)	964	964
Other adjustments	149	149	93	93
Changes in CET1 capital	(624)	(624)	580	580
CET1 capital balance, end of period	11,580	11,580	12,204	12,204
Additional tier 1 capital:				
Tier 1 capital balance, beginning of period	15,382	15,382	14,717	14,717
Change in CET1 capital	(624)	(624)	580	580
Net issuance of preferred stock	494	494	—	—
Trust preferred capital securities phased out of tier 1 capital	—	—	—	—
Other adjustments	18	18	85	85
Changes in tier 1 capital	(112)	(112)	665	665
Tier 1 capital balance, end of period	15,270	15,270	15,382	15,382
Tier 2 capital:				
Tier 2 capital balance, beginning of period	985	1,053	1,192	1,250
Net issuance and changes in long-term debt qualifying as tier 2	(202)	(202)	(192)	(192)
Changes in ALLL and other	10	11	(15)	(5)
Change in other adjustments	(1)	(1)	—	—
Changes in tier 2 capital	(193)	(192)	(207)	(197)
Tier 2 capital balance, end of period	792	861	985	1,053
Total capital:				
Total capital balance, beginning of period	16,367	16,435	15,909	15,967
Changes in tier 1 capital	(112)	(112)	665	665

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Changes in tier 2 capital	(193)	(192)	(207)	(197)
Total capital balance, end of period	\$ 16,062		\$ 16,131		\$ 16,367		\$ 16,435	

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The following table presents a roll-forward of the Basel III advanced approaches RWA for the years ended December 31, 2018 and 2017.

TABLE 41: ADVANCED APPROACHES RWA ROLL-FORWARD

(In millions)	December 31, 2018	December 31, 2017
Total RWA, beginning of period	\$99,156	\$99,301
Changes in credit RWA:		
Net increase (decrease) in investment securities-wholesale	(940)	2,914
Net increase (decrease) in loans and leases	(12)	30
Net increase (decrease) in securitization exposures	(3,666)	(683)
Net increase (decrease) in repo-style transaction exposures	(19)	440
Net increase (decrease) in OTC derivatives exposures	(1,170)	(1,129)
Net increase (decrease) in all other ⁽¹⁾	1,545	(2,543)
Net increase (decrease) in credit RWA	(4,262)	(971)
Net increase (decrease) in market RWA	183	(417)
Net increase (decrease) in operational RWA	238	1,243
Total RWA, end of period	\$95,315	\$99,156

⁽¹⁾ Includes assets not in a definable category, cleared transactions, non-material portfolio, other wholesale, cash and due from, and interest-bearing deposits with banks, equity exposures, and 6% credit risk supervisory charge.

As of December 31, 2018, total advanced approaches RWA decreased \$3.8 billion compared to December 31, 2017, primarily due to lower credit RWA. The decrease in credit RWA was primarily due to the sale of \$26 billion of non-HQLA within the investment securities portfolio in the year ended December 31, 2018 and lower exposure at default on FX contracts, partially offset by increases in all other exposures.

The following table presents a roll-forward of the Basel III standardized approach RWA for the years ended December 31, 2018 and 2017.

TABLE 42: STANDARDIZED APPROACH RWA ROLL-FORWARD

(In millions)	December 31, 2018	December 31, 2017
Total RWA, beginning of period ⁽¹⁾	\$102,683	\$99,876
Changes in credit RWA:		
Net increase (decrease) in investment securities-wholesale	(2,887)	1,729
Net increase (decrease) in loans and leases	3,104	2,589
Net increase (decrease) in securitization exposures	(3,666)	(690)
Net increase (decrease) in repo-style transaction exposures	(3,156)	2,058
Net increase (decrease) in OTC derivatives exposures	(46)	(1,709)
Net increase (decrease) in all other ⁽²⁾	2,605	(753)
Net increase (decrease) in credit RWA	(4,046)	3,224
Net increase (decrease) in market RWA	183	(417)
Total RWA, end of period	\$98,820	\$102,683

⁽¹⁾ Standardized approach RWA as of the periods noted above were calculated using our estimates, based on our then current interpretation of the Basel III final rule.

⁽²⁾ Includes assets not in a definable category, cleared transactions, other wholesale, cash and due from, and interest-bearing deposits with banks and equity exposures.

As of December 31, 2018, total standardized approach RWA decreased \$3.9 billion compared to December 31, 2017, primarily due to lower credit RWA. The main drivers of the credit RWA change were the sale of \$26 billion of non-HQLA within the investment securities portfolio and decreased repo-style transaction exposures. These decreases were partially offset by higher overdrafts and loans with corporates (both which have a higher prescribed risk weight under the standardized approach), and increases in all other exposures in the year ended December 31, 2018.

The regulatory capital ratios as of December 31, 2018, presented in Table 39: Regulatory Capital Structure and Related Regulatory Capital Ratios, are calculated under the standardized approach and advanced approaches in conformity with the Basel III final rule. The advanced approaches-based ratios reflect calculations and determinations with respect to our capital and related matters as of December 31, 2018, based on our and external data, quantitative formulae, statistical models, historical correlations and assumptions, collectively referred to as “advanced systems,” in effect and used by us for those purposes as of the time we first reported such ratios in a quarterly report on Form 10-Q or an annual report on Form 10-K. Significant components of these advanced systems involve the exercise of judgment by us and our regulators, and our advanced systems may not, individually or collectively, precisely represent or

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calculate the scenarios, circumstances, outputs or other results for which they are designed or intended.

Our advanced systems are subject to update and periodic revalidation in response to changes in our business activities and our historical experiences, forces and events experienced by the market broadly or by individual financial institutions, changes in regulations and regulatory interpretations and other factors, and are also subject to continuing regulatory review and approval. For example, a significant operational loss experienced by another financial institution, even if we do not experience a related loss, could result in a material change in the output of our advanced systems and a corresponding material change in our risk exposures, our total RWA and our capital ratios compared to prior periods. An operational loss that we experience could also result in a material change in our capital requirements for operational risk under the advanced approaches, depending on the severity of the loss event, its characterization among the seven Basel-defined UOM, and the stability of the distributional approach for a particular UOM, and without direct correlation to the effects of the loss event, or the timing of such effects, on our results of operations. Due to the influence of changes in these advanced systems, whether resulting from changes in data inputs, regulation or regulatory supervision or interpretation, specific to us or market activities or experiences or other updates or factors, we expect that our advanced systems and our capital ratios calculated in conformity with the Basel III final rule will change and may be volatile over time, and that those latter changes or volatility could be material as calculated and measured from period to period. The full effects of the Basel III final rule on us and State Street Bank are therefore subject to further evaluation and also to further regulatory guidance, action or rule-making.

Regulatory Developments

In April 2018, the FRB issued a proposed rule which would replace the current 2% supplementary leverage ratio buffer for G-SIBs, with a buffer equal to 50% of their G-SIB buffer. This proposal would also make conforming modifications to our TLAC and eligible LTD requirements applicable to G-SIBs.

In addition, the FRB has issued a separate proposed rule replacing the current 2.5% capital conservation buffer with a firm specific buffer (referred to as the Stress Capital Buffer or SCB), updated annually and tailored to reflect the results of the most recent Federal Reserve's CCAR supervisory severely adverse scenario stress test. The proposal also introduces a Stress Leverage Buffer (SLB) applicable to the tier 1 leverage ratio. Under the proposal, both the SCB and SLB would become effective October 1, 2019. Changes to the final rules, if and when proposed, may be material and the application of the proposed rule

involves estimates which cannot reasonably be made at present. Consequently, we have not estimated the impact of the proposed rule.

The EGRRCPA, which was signed into law by the U.S. President in May 2018, includes modifications to the SLR requirements as applied to custody banks. Specifically, the modifications would allow certain central bank deposits to be excluded from the SLR denominator, or total leverage exposure. In addition, the Act may impact our TLAC and LTD requirements as the definition of the supplementary leverage ratio has been modified for custodial banks. Our estimates as to our LTD needs at December 31, 2018, to satisfy TLAC and LTD requirements, are subject to updates based on the changing regulatory landscape and additional regulatory guidance and interpretation.

Supplementary Leverage Ratio

In 2014, U.S. banking regulators issued final rules implementing an SLR, for certain bank holding companies, like us, and their insured depository institution subsidiaries, like State Street Bank, which we refer to as the SLR final rule. The SLR final rule requires that, as of January 1, 2018, (i) State Street Bank maintain an SLR of at least 6% to be well capitalized under the U.S. banking regulators' PCA framework and (ii) we maintain an SLR of at least 5% to avoid limitations on capital distributions and discretionary bonus payments. In addition to the SLR, we are subject to a minimum tier 1 leverage ratio of 4%, which differs from the SLR primarily in that the denominator of the tier 1 leverage ratio is only a quarterly average of on-balance sheet assets and does not include any off-balance sheet exposures.

TABLE 43: TIER 1 AND SUPPLEMENTARY LEVERAGE RATIOS

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(In millions)	December 31, 2018
State Street:	
Tier 1 capital	\$ 15,270
Average assets	221,350
Less: adjustments for deductions from tier 1 capital	(9,426)
Adjusted average assets	211,924
Off-balance sheet exposures	29,279
Total assets for SLR	\$ 241,203
Tier 1 leverage ratio ⁽¹⁾	7.2 %
Supplementary leverage ratio	6.3
State Street Bank:	
Tier 1 capital	\$ 16,941
Average assets	218,402
Less: adjustments for deductions from tier 1 capital	(8,989)
Adjusted average assets	209,413
Off-balance sheet exposures	29,368
Total assets for SLR	\$ 238,781
Tier 1 leverage ratio ⁽¹⁾	8.1 %
Supplementary leverage ratio	7.1

⁽¹⁾ Tier 1 leverage ratio as of December 31, 2018 were calculated in conformity with the Basel III final rule.

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Capital Actions

Preferred Stock

In September 2018, we issued 500,000 depositary shares, each representing 1/100th ownership interest in a share of our fixed-to-floating rate non-cumulative perpetual preferred stock, Series H, without par value per share, with a liquidation preference of \$100,000 per share (equivalent to \$1,000 per depositary share), in a public offering. The aggregate proceeds, net of underwriting discounts, commissions and other issuance costs, were approximately \$500 million, and were used to fund a portion of our acquisition of Charles River Development on October 1, 2018.

Dividends on the Series H Preferred stock are paid semi-annually and commenced on December 15, 2018, with the first dividend paid on a pro-rata basis.

The following table summarizes selected terms of each of the series of the preferred stock issued and outstanding as of December 31, 2018:

TABLE 44: PREFERRED STOCK ISSUED AND OUTSTANDING

	Issuance Date	Depositary Shares Issued	Ownership Interest Per Depositary Share	Liquidation Preference Per Share	Liquidation Preference Per Depositary Share	Net Proceeds of Offering (In millions)	Redemption Date ⁽¹⁾
Preferred Stock ⁽²⁾ :							
Series C	August 2012	20,000,000	1/4,000th	\$ 100,000	\$ 25	\$ 488	September 15, 2017
Series D	February 2014	30,000,000	1/4,000th	100,000	25	742	March 15, 2024
Series E	November 2014	30,000,000	1/4,000th	100,000	25	728	December 15, 2019
Series F	May 2015	750,000	1/100th	100,000	1,000	742	September 15, 2020
Series G	April 2016	20,000,000	1/4,000th	100,000	25	493	March 15, 2026
Series H	September 2018	500,000	1/100th	100,000	1,000	494	December 15, 2023

⁽¹⁾ On the redemption date, or any dividend declaration date thereafter, the preferred stock and corresponding depositary shares may be redeemed by us, in whole or in part, at the liquidation price per share and liquidation price per depositary share plus any declared and unpaid dividends, without accumulation of any undeclared dividends.

⁽²⁾ The preferred stock and corresponding depositary shares may be redeemed at our option in whole, but not in part, prior to the redemption date upon the occurrence of a regulatory capital treatment event, as defined in the certificate of designation, at a redemption price equal to the liquidation price per share and liquidation price per depositary share plus any declared and unpaid dividends, without accumulation of any undeclared dividends.

The following table presents the dividends declared for each of the series of preferred stock issued and outstanding for the periods indicated:

TABLE 45: PREFERRED STOCK DIVIDENDS

Years Ended December 31,					
2018			2017		
Dividends Declared per	Dividends Declared per	Total (In millions)	Dividends Declared per	Dividends Declared per	Total (In millions)

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	Share	Depository Share		Share	Depository Share	
Preferred Stock:						
Series C	\$5,250	\$ 1.32	\$ 26	\$5,250	\$ 1.32	\$ 26
Series D	5,900	1.48	44	5,900	1.48	44
Series E	6,000	1.52	45	6,000	1.52	45
Series F	5,250	52.50	40	5,250	52.50	40
Series G	5,352	1.32	27	5,352	1.32	27
Series H	1,219	12.18	6	—	—	—
Total			\$ 188			\$ 182

In January 2019, we declared dividends on our Series C, D, E, F and G preferred stock of approximately \$1,313, \$1,475, \$1,500, \$2,625 and \$1,338, respectively, per share, or approximately \$0.33, \$0.37, \$0.38, \$26.25 and \$0.33, respectively, per depository share. These dividends total approximately \$6 million, \$11 million, \$11 million, \$20 million and \$7 million on our Series C, D, E, F and G preferred stock, respectively, which will be paid in March 2019.

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Common Stock

In July 2018, we completed a public offering of approximately 13.24 million shares of our common stock. The offering price was \$86.93 per share and net proceeds totaled approximately \$1.15 billion, and were used to fund a portion of our acquisition of Charles River Development on October 1, 2018.

In June 2017, our Board approved a common stock purchase program authorizing the purchase of up to \$1.4 billion of our common stock through June 30, 2018 (the 2017 Program). In June 2018, the Federal Reserve issued a conditional non-objection to our capital plan submitted as part of the 2018 CCAR submission; and in connection with such capital plan our Board approved a common stock purchase program authorizing the purchase of up to \$1.2 billion of our common stock through June 30, 2019 (the 2018 Program). In connection with our acquisition of Charles River Development, we did not repurchase any common stock during either the second quarter of 2018 under the 2017 Program or the third and fourth quarters of 2018 under the 2018 Program. We have resumed our common stock purchase program in the first quarter of 2019 and may repurchase up to \$600 million through June 30, 2019 under the 2018 Program.

The table below presents the activity under our common stock purchase program during the period indicated:

TABLE 46: SHARES
REPURCHASED

	Year Ended December 31, 2018 ⁽¹⁾		
	Shares Acquired (In millions)	Average Cost per Share (In millions)	Total Acquired (In millions)
2017 Program	3.3	\$ 105.31	\$ 350

⁽¹⁾ During the year ended December 31, 2018, there were no shares repurchased under the 2018 Program.

The table below presents the dividends declared on common stock for the periods indicated:

TABLE 47: COMMON STOCK DIVIDENDS

	Years Ended December 31, 2018		2017	
	Dividends Declared per Share	Total (In millions)	Dividends Declared per Share	Total (In millions)
Common Stock	\$ 1.78	\$ 665	\$ 1.60	\$ 596

Federal and state banking regulations place certain restrictions on dividends paid by subsidiary banks to the parent holding company. In addition, banking regulators have the authority to prohibit bank holding companies from paying dividends. For information concerning limitations on dividends from our subsidiary banks, refer to "Related Stockholder Matters" included under Item 5, Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities, and to Note 15 to the consolidated financial statements in this Form 10-K. Our common stock and preferred stock dividends, including the declaration, timing and amount thereof, are subject to consideration and approval by the Board at the relevant times.

Stock purchases may be made using various types of mechanisms, including open market purchases, accelerated share repurchases or transactions off market and may be made under Rule 10b5-1 trading programs. The timing of stock purchases, types of transactions and number of shares purchased will depend on several factors, including, market conditions and our capital positions, financial performance and investment opportunities. The common stock purchase

program does not have specific price targets and may be suspended at any time.

OFF-BALANCE SHEET ARRANGEMENTS

On behalf of clients enrolled in our securities lending program, we lend securities to banks, broker/dealers and other institutions. In most circumstances, we indemnify our clients for the fair market value of those securities against a failure of the borrower to return such securities. Though these transactions are collateralized, the substantial volume of these activities necessitates detailed credit-based underwriting and monitoring processes. The aggregate amount of indemnified securities on loan totaled \$342.34 billion as of December 31, 2018, compared to \$381.82 billion as of December 31, 2017. We require the borrower to provide collateral in an amount in excess of 100% of the fair market value of the securities borrowed. We hold the collateral received in connection with these securities lending services as agent, and the collateral is not recorded in our consolidated statement of condition. We revalue the securities on loan and the collateral daily to determine if additional collateral is necessary or if excess collateral is required to be returned to the borrower. We held, as agent, cash and securities totaling \$357.89 billion and \$400.83 billion as collateral for indemnified securities on loan as of December 31, 2018 and December 31, 2017, respectively. The cash collateral held by us as agent is invested on behalf of our clients. In certain cases, the cash collateral is invested in third-party repurchase agreements, for which we indemnify the client against

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loss of the principal invested. We require the counterparty to the indemnified repurchase agreement to provide collateral in an amount in excess of 100% of the amount of the repurchase agreement. In our role as agent, the indemnified repurchase agreements and the related collateral held by us are not recorded in our consolidated statement of condition. Of the collateral of \$357.89 billion and \$400.83 billion, referenced above, \$42.61 billion and \$61.27 billion was invested in indemnified repurchase agreements as of December 31, 2018 and December 31, 2017, respectively. We or our agents held \$45.06 billion and \$65.27 billion as collateral for indemnified investments in repurchase agreements as of December 31, 2018 and December 31, 2017, respectively.

Additional information about our securities finance activities and other off-balance sheet arrangements is provided in Notes 10, 12 and 14 to the consolidated financial statements in this Form 10-K.

SIGNIFICANT ACCOUNTING ESTIMATES

Our consolidated financial statements are prepared in conformity with U.S. GAAP, and we apply accounting policies that affect the determination of amounts reported in the consolidated financial statements. Additional information on our significant accounting policies, including references to applicable footnotes, is provided in Note 1 to the consolidated financial statements in this Form 10-K.

Certain of our accounting policies, by their nature, require management to make judgments, involving significant estimates and assumptions, about the effects of matters that are inherently uncertain. These estimates and assumptions are based on information available as of the date of the consolidated financial statements, and changes in this information over time could materially affect the amounts of assets, liabilities, equity, revenue and expenses reported in subsequent consolidated financial statements.

Based on the sensitivity of reported financial statement amounts to the underlying estimates and assumptions, the more significant accounting policies applied by us have been identified by management as those associated with recurring fair value measurements, impairment of goodwill and other intangible assets, and contingencies. These accounting policies require the most subjective or complex judgments, and underlying estimates and assumptions could be most subject to revision as new information becomes available. An understanding of the judgments, estimates and assumptions underlying these accounting policies is essential in order to understand our reported consolidated results of operations and financial condition.

The following is a discussion of the above-mentioned significant accounting estimates.

Management has discussed these significant accounting estimates with the E&A Committee of the Board.

Fair Value Measurements

We carry certain of our financial assets and liabilities at fair value in our consolidated financial statements on a recurring basis, including trading account assets and liabilities, AFS debt securities, certain equity securities and various types of derivative financial instruments.

Changes in the fair value of these financial assets and liabilities are recorded either as components of our consolidated statement of income or as components of other comprehensive income within shareholders' equity in our consolidated statement of condition. In addition to those financial assets and liabilities that we carry at fair value in our consolidated financial statements on a recurring basis, we estimate the fair values of other financial assets and liabilities that we carry at amortized cost in our consolidated statement of condition, and we disclose these fair value estimates in the notes to our consolidated financial statements. We estimate the fair values of these financial assets and liabilities using the definition of fair value described below. Additional information with respect to the assets and liabilities carried by us at fair value on a recurring basis is provided in Note 2 to the consolidated financial statements in this Form 10-K.

U.S. GAAP defines fair value as the price that would be received to sell an asset or paid to transfer a liability in the principal or most advantageous market for an asset or liability in an orderly transaction between market participants on the measurement date. When we measure fair value for our financial assets and liabilities, we consider the principal or the most advantageous market in which we would transact; we also consider assumptions that market participants would use when pricing the asset or liability. When possible, we look to active and observable markets to measure the

fair value of identical, or similar, financial assets and liabilities. When identical financial assets and liabilities are not traded in active markets, we look to market-observable data for similar assets and liabilities. In some instances, certain assets and liabilities are not actively traded in observable markets; as a result, we use alternate valuation techniques to measure their fair value.

We categorize the financial assets and liabilities that we carry at fair value in our consolidated statement of condition on a recurring basis based on U.S. GAAP's prescribed three-level valuation hierarchy. The hierarchy gives the highest priority to quoted prices in active markets for identical assets or liabilities (level 1) and the lowest priority to valuation methods using significant unobservable inputs (level 3).

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With respect to derivative instruments, we evaluated the fair value impact of the credit risk of our counterparties. We considered such factors as the market-based probability of default by our counterparties, and our current and expected potential future net exposures by remaining maturities, in determining the appropriate measurements of fair value.

Goodwill and Other Intangible Assets

Goodwill represents the excess of the cost of an acquisition over the fair value of the net tangible and other intangible assets acquired at the acquisition date. Other intangible assets represent purchased long-lived intangible assets, primarily client relationships, core deposit intangible assets and technology that can be distinguished from goodwill because of contractual rights or because the asset can be exchanged on its own or in combination with a related contract, asset or liability. Other intangible assets are initially measured at their acquisition date fair value, the determination of which requires management judgment. Goodwill is not amortized, while other intangible assets are amortized over their estimated useful lives.

Management reviews goodwill for impairment annually or more frequently if circumstances arise or events occur that indicate an impairment of the carrying amount may exist. We begin our review by first assessing qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount.

Events that may indicate impairment include: significant or adverse changes in the business, economic or political climate; an adverse action or assessment by a regulator; unanticipated competition; and a more-likely-than-not expectation that we will sell or otherwise dispose of a business to which the goodwill or other intangible assets relate. If we conclude from the qualitative assessment of goodwill impairment that it is more likely than not that a reporting unit's fair value is greater than its carrying amount, quantitative tests are not required. However, if we determine it is more likely than not that a reporting unit's fair value is less than its carrying amount, then we complete a quantitative assessment to determine if there is goodwill impairment.

During 2018, we assessed goodwill for impairment using a qualitative assessment. Based on our evaluation of the qualitative factors noted above, we determined that it was more likely than not that the fair value of each of the reporting units exceeded its respective carrying amount.

Other intangible assets are supported by the future cash flows that are directly associated with and expected to arise as a direct result of the use of the intangible asset, less any costs associated with the intangible asset's eventual disposition. We evaluate other intangible assets for impairment at the lowest level

for which there are identifiable cash flows that are largely independent of the cash flows from other groups of assets using the following process. First, we routinely assess whether impairment indicators are present. When impairment indicators are identified as being present, we compare the estimated future net undiscounted cash flows of the intangible asset with its carrying value. If the future net undiscounted cash flows are greater than the carrying value, then there is no impairment, but if the intangible asset's net undiscounted cash flows are less than its carrying value, we are required to calculate impairment. An impairment is recognized by writing the intangible asset down to its fair value. We evaluate intangible assets for indicators of impairment on a quarterly basis. There were no impairments taken on other intangible assets in 2018.

Additional information about goodwill and other intangible assets, including information by line of business, is provided in Note 5 to the consolidated financial statements in this Form 10-K.

Contingencies

Information on significant estimates and judgments related with establishing litigation reserves is discussed in Note 13 of the consolidated financial statements in this Form 10-K.

RECENT ACCOUNTING DEVELOPMENTS

Information with respect to recent accounting developments is provided in Note 1 to the consolidated financial statements in this Form 10-K.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

The information provided under "Market Risk Management" in "Financial Condition" in our Management's Discussion and Analysis in this Form 10-K, is incorporated by reference herein.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Additional information about restrictions on the transfer of funds from State Street Bank to the Parent Company is provided under "Related Stockholder Matters" in Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities, and under "Capital" in "Financial Condition" in our Management's Discussion and Analysis in this Form 10-K.

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Report of Ernst & Young LLP, Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors of

State Street Corporation

Opinion on the Financial Statements

We have audited the accompanying consolidated statements of condition of State Street Corporation (the "Corporation") as of December 31, 2018 and 2017, 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, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Corporation at December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the Corporation's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated February 21, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

These consolidated financial statements are the responsibility of the Corporation's management. Our responsibility is to express an opinion on the Corporation's consolidated financial statements based on our audits. We are a public accounting firm registered with the 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 audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits 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. We believe that our audits provide a reasonable basis for our opinion.

/s/ Ernst & Young LLP

We have served as the Corporation's auditor since 1972.

Boston, Massachusetts

February 21, 2019

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STATE STREET CORPORATION
CONSOLIDATED STATEMENT OF INCOME

(Dollars in millions, except per share amounts)	Years Ended December		
	2018	2017	2016
Fee revenue:			
Servicing fees	\$5,421	\$5,365	\$5,073
Management fees	1,851	1,616	1,292
Foreign exchange trading services	1,201	1,071	1,099
Securities finance	543	606	562
Processing fees and other	289	247	90
Total fee revenue	9,305	8,905	8,116
Net interest income:			
Interest income	3,662	2,908	2,512
Interest expense	991	604	428
Net interest income	2,671	2,304	2,084
Gains (losses) related to investment securities, net:			
Gains (losses) from sales of available-for-sale securities, net	9	(39)	10
Losses from other-than-temporary impairment	(3)	—	(2)
Losses reclassified (from) to other comprehensive income	—	—	(1)
Gains (losses) related to investment securities, net	6	(39)	7
Total revenue	11,982	11,170	10,207
Provision for loan losses	15	2	10
Expenses:			
Compensation and employee benefits	4,780	4,394	4,353
Information systems and communications	1,324	1,167	1,105
Transaction processing services	938	838	800
Occupancy	500	461	440
Acquisition and restructuring costs	24	266	209
Amortization of other intangible assets	226	214	207
Other	1,176	929	963
Total expenses	8,968	8,269	8,077
Income before income tax expense (benefit)	2,999	2,899	2,120
Income tax expense (benefit)	400	722	(22)
Net income from non-controlling interest	—	—	1
Net income	\$2,599	\$2,177	\$2,143
Net income available to common shareholders	\$2,410	\$1,993	\$1,968
Earnings per common share:			
Basic	\$6.48	\$5.32	\$5.03
Diluted	6.40	5.24	4.97
Average common shares outstanding (in thousands):			
Basic	371,983	374,793	391,485
Diluted	376,476	380,213	396,090
Cash dividends declared per common share	\$1.78	\$1.60	\$1.44

The accompanying notes are an integral part of these consolidated financial statements.

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STATE STREET CORPORATION
CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME

(In millions)	Years Ended December		
	31, 2018	2017	2016
Net income	\$2,599	\$2,177	\$2,143
Other comprehensive income (loss), net of related taxes:			
Foreign currency translation, net of related taxes of (\$8), \$21 and (\$11), respectively	(67)	900	(372)
Net unrealized gains (losses) on available-for-sale securities, net of reclassification adjustment and net of related taxes of (\$134), \$272 and (\$119), respectively	(302)	367	(181)
Net unrealized gains (losses) on available-for-sale securities designated in fair value hedges, net of related taxes of \$9, \$16 and \$16, respectively	24	22	23
Other-than-temporary impairment on held-to-maturity securities related to factors other than credit, net of related taxes of \$2, \$3 and \$5, respectively	4	3	7
Net unrealized gains (losses) on cash flow hedges, net of related taxes of (\$17), (\$181) and (\$42), respectively	(33)	(285)	(64)
Net unrealized gains (losses) on retirement plans, net of related taxes of \$8, \$8 and \$1, respectively	27	24	(11)
Other comprehensive income (loss)	(347)	1,031	(598)
Total comprehensive income	\$2,252	\$3,208	\$1,545

The accompanying notes are an integral part of these consolidated financial statements.

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STATE STREET CORPORATION
CONSOLIDATED STATEMENT OF CONDITION

	December 31,	
	2018	2017
(Dollars in millions, except per share amounts)		
Assets:		
Cash and due from banks	\$3,597	\$2,107
Interest-bearing deposits with banks	73,040	67,227
Securities purchased under resale agreements	4,679	3,241
Trading account assets	860	1,093
Investment securities available-for-sale	45,148	57,121
Investment securities held-to-maturity (fair value of \$41,351 and \$40,255)	41,914	40,458
Loans and leases (less allowance for losses of \$67 and \$54)	25,722	23,240
Premises and equipment (net of accumulated depreciation of \$4,152 and \$3,881)	2,214	2,186
Accrued interest and fees receivable	3,203	3,099
Goodwill	7,446	6,022
Other intangible assets	2,369	1,613
Other assets	34,434	31,018
Total assets	\$244,626	\$238,425
Liabilities:		
Deposits:		
Non-interest-bearing	\$44,804	\$47,175
Interest-bearing - U.S.	66,235	50,139
Interest-bearing - non-U.S.	69,321	87,582
Total deposits	180,360	184,896
Securities sold under repurchase agreements	1,082	2,842
Other short-term borrowings	3,092	1,144
Accrued expenses and other liabilities	24,209	15,606
Long-term debt	11,093	11,620
Total liabilities	219,836	216,108
Commitments, guarantees and contingencies (Notes 12 and 13)		
Shareholders' equity:		
Preferred stock, no par, 3,500,000 shares authorized:		
Series C, 5,000 shares issued and outstanding	491	491
Series D, 7,500 shares issued and outstanding	742	742
Series E, 7,500 shares issued and outstanding	728	728
Series F, 7,500 shares issued and outstanding	742	742
Series G, 5,000 shares issued and outstanding	493	493
Series H, 5,000 shares issued and outstanding	494	—
Common stock, \$1 par, 750,000,000 shares authorized: 503,879,642 and 503,879,642 shares issued, and 379,946,724 and 367,649,858 shares outstanding	504	504
Surplus	10,061	9,799
Retained earnings	20,606	18,856
Accumulated other comprehensive income (loss)	(1,356)	(1,009)
Treasury stock, at cost (123,932,918 and 136,229,784 shares)	(8,715)	(9,029)
Total shareholders' equity	24,790	22,317
Total liabilities and shareholders' equity	\$244,626	\$238,425

The accompanying notes are an integral part of these consolidated financial statements.

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STATE STREET CORPORATION
CONSOLIDATED STATEMENT OF CHANGES IN SHAREHOLDERS' EQUITY

(Dollars in millions, except per share amounts, shares in thousands)	Common Stock				Retained Earnings	Accumulated Treasury Stock		Total	
	Preferred Stock	Shares	Amount	Surplus		Other Comprehensive Income (Loss)	Shares		Amount
Balance as of December 31, 2015	\$ 2,703	503,880	\$ 504	\$ 9,746	\$ 16,049	\$ (1,442)	104,228	\$(6,457)	\$ 21,103
Net income					2,143				2,143
Other comprehensive income (loss)						(598)			(598)
Preferred stock issued	493								493
Cash dividends declared:									
Common stock - \$1.44 per share					(559)				(559)
Preferred stock					(173)				(173)
Common stock acquired							21,098	(1,365)	(1,365)
Common stock awards and options vested, including income tax benefit of \$13				36			(3,369)	139	175
Other					(1)		(16)	1	—
Balance as of December 31, 2016	\$ 3,196	503,880	\$ 504	\$ 9,782	\$ 17,459	\$ (2,040)	121,941	\$(7,682)	\$ 21,219
Net income					2,177				2,177
Other comprehensive income						1,031			1,031
Cash dividends declared:									
Common stock - \$1.60 per share					(596)				(596)
Preferred stock					(182)				(182)
Common stock acquired							16,788	(1,450)	(1,450)
Common stock awards vested				16			(2,503)	104	120
Other				1	(2)		4	(1)	(2)
Balance as of December 31, 2017	\$ 3,196	503,880	\$ 504	\$ 9,799	\$ 18,856	\$ (1,009)	136,230	\$(9,029)	\$ 22,317
Net income					2,599				2,599
Other comprehensive income (loss)						(347)			(347)
Preferred stock issued	494								494
Common stock issued				586			(13,244)	564	1,150
Cash dividends declared:									
Common stock - \$1.78 per share					(665)				(665)
Preferred stock					(188)				(188)
Common stock acquired							3,324	(350)	(350)
Common stock awards vested				44			(2,389)	101	145

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Other				(368)	4			12	(1)	(365)
Balance as of December 31, 2018	\$ 3,690	503,880	\$ 504	\$ 10,061	\$ 20,606	\$ (1,356)		123,933	\$(8,715)	\$24,790

The accompanying notes are an integral part of these consolidated financial statements.

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STATE STREET CORPORATION
CONSOLIDATED STATEMENT OF CASH FLOWS

	Years Ended December		
	31,		
(In millions)	2018	2017	2016
Operating Activities:			
Net income	\$2,599	\$2,177	\$2,143
Adjustments to reconcile net income to net cash provided by (used in) operating activities:			
Deferred income tax (benefit)	(145)	95	(358)
Amortization of other intangible assets	226	214	207
Other non-cash adjustments for depreciation, amortization and accretion, net	977	871	722
(Gains) losses related to investment securities, net	(6)	39	(7)
Change in trading account assets, net	233	(69)	(175)
Change in accrued interest and fees receivable, net	26	(455)	(298)
Change in collateral deposits, net	7,326	1,819	(18)
Change in unrealized (gains) losses on foreign exchange derivatives, net	(1,836)	3,267	(1,057)
Change in other assets, net	260	(1,341)	1,772
Change in accrued expenses and other liabilities, net	397	9	(1,147)
Other, net	400	307	506
Net cash provided by operating activities	10,457	6,933	2,290
Investing Activities:			
Net (increase) decrease in interest-bearing deposits with banks	(5,813)	3,708	4,403
Net (increase) decrease in securities purchased under resale agreements	(1,438)	(1,285)	1,448
Proceeds from sales of available-for-sale securities	26,082	12,439	1,401
Proceeds from maturities of available-for-sale securities	14,645	28,878	30,070
Purchases of available-for-sale securities	(31,814)	(34,841)	(30,162)
Proceeds from maturities of held-to-maturity securities	6,296	4,028	7,942
Purchases of held-to-maturity securities	(6,539)	(8,772)	(8,425)
Net (increase) in loans and leases	(2,461)	(3,511)	(924)
Business acquisitions, net of cash acquired	(2,595)	—	(437)
Purchases of equity investments and other long-term assets	(326)	(233)	(643)
Purchases of premises and equipment, net	(609)	(637)	(613)
Proceeds from sale of joint venture investment	—	172	—
Other, net	76	102	170
Net cash (used in) provided by investing activities	(4,496)	48	4,230
Financing Activities:			
Net increase (decrease) in time deposits	6,673	(15,306)	8,488
Net (decrease) increase in all other deposits	(11,209)	13,040	(12,952)
Net increase (decrease) in other short-term borrowings	188	(1,999)	(268)
Proceeds from issuance of long-term debt, net of issuance costs	995	747	1,492
Payments for long-term debt and obligations under capital leases	(1,461)	(493)	(1,441)
Proceeds from issuance of preferred stock, net of issuance costs	495	—	493
Proceeds from issuance of common stock, net of issuance costs	1,150	—	—
Repurchases of common stock	(350)	(1,292)	(1,365)
Excess tax benefit related to stock-based compensation	—	—	13
Repurchases of common stock for employee tax withholding	(124)	(126)	(122)
Payments for cash dividends	(828)	(768)	(723)
Other, net	—	9	(28)
Net cash (used in) financing activities	(4,471)	(6,188)	(6,413)
Net increase	1,490	793	107

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Cash and due from banks at beginning of period	2,107	1,314	1,207
Cash and due from banks at end of period	\$3,597	\$2,107	\$1,314
Supplemental disclosure:			
Interest paid	\$981	\$593	\$441
Income taxes paid, net	549	345	371

The accompanying notes are an integral part of these consolidated financial statements.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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We use acronyms and other defined terms for certain business terms and abbreviations, as defined in the acronyms list and glossary accompanying these consolidated financial statements.

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STATE STREET CORPORATION

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 1. Summary of Significant Accounting Policies

Basis of Presentation

The accounting and financial reporting policies of State Street Corporation conform to U.S. GAAP. State Street Corporation, the Parent Company, is a financial holding company headquartered in Boston, Massachusetts. Unless otherwise indicated or unless the context requires otherwise, all references in these notes to consolidated financial statements to “State Street,” “we,” “us,” “our” or similar references mean State Street Corporation and its subsidiaries on a consolidated basis, including our principal banking subsidiary, State Street Bank.

We have two lines of business:

Investment Servicing provides a suite of related products and services including: custody; product and participant level accounting; daily pricing and administration; master trust and master custody; depotbank services (a fund oversight role created by regulation); record-keeping; cash management; foreign exchange, brokerage and other trading services; securities finance; our enhanced custody product, which integrates principal securities lending and custody; deposit and short-term investment facilities; loans and lease financing; investment manager and alternative investment manager operations outsourcing; performance, risk and compliance analytics; and financial data management to support institutional investors. New products and services resulting from our acquisition of Charles River Development on October 1, 2018 include: portfolio modeling and construction, trade order management, investment risk and compliance and wealth management solutions.

Investment Management, through State Street Global Advisors, provides a broad range of investment management strategies and products for our clients. Our investment management strategies and products span the risk/reward spectrum, including core and enhanced indexing, multi-asset strategies, active quantitative and fundamental active capabilities and alternative investment strategies. Our AUM is currently primarily weighted to indexed strategies. In addition, we provide a breadth of services and solutions, including environmental, social and governance investing, defined benefit and defined contribution and OCIO. State Street Global Advisors is also a provider of ETFs, including the SPDR® ETF brand.

Consolidation

Our consolidated financial statements include the accounts of the Parent Company and its majority- and wholly-owned and otherwise controlled subsidiaries, including State Street Bank. All material inter-company transactions and balances have been eliminated.

Certain previously reported amounts have been reclassified to conform to current-year presentation.

We consolidate subsidiaries in which we exercise control. Investments in unconsolidated subsidiaries, recorded in other assets, generally are accounted for under the equity method of accounting if we have the ability to exercise significant influence over the operations of the investee. For investments accounted for under the equity method, our share of income or loss is recorded in processing fees and other revenue in our consolidated statement of income. Investments not meeting the criteria for equity-method treatment are measured at fair value through earnings, except for investments where a fair market value is not readily available, which are accounted for under the cost method of accounting.

Use of Estimates

The preparation of consolidated financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions in the application of certain of our significant accounting policies that may materially affect the reported amounts of assets, liabilities, equity, revenue and expenses. As a result of unanticipated events or circumstances, actual results could differ from those estimates.

Foreign Currency Translation

The assets and liabilities of our operations with functional currencies other than the U.S. dollar are translated at month-end exchange rates, and revenue and expenses are translated at rates that approximate average monthly exchange rates. Gains or losses from the translation of the net assets of subsidiaries with functional currencies other than the U.S. dollar, net of related taxes, are recorded in AOCI, a component of shareholders' equity.

Cash and Cash Equivalents

For purposes of the consolidated statement of cash flows, cash and cash equivalents are defined as cash and due from banks.

Interest-Bearing Deposits with Banks

Interest-bearing deposits with banks generally consist of highly liquid, short-term investments maintained at the Federal Reserve Bank and other non-U.S. central banks with original maturities at the time of purchase of one month or less.

Securities Purchased Under Resale Agreements and Securities Sold Under Repurchase Agreements

Securities purchased under resale agreements and sold under repurchase agreements are treated as collateralized financing transactions, and are recorded in our consolidated statement of condition at the amounts at which the securities will be subsequently resold or repurchased, plus accrued interest. Our policy is to take possession or control of securities underlying resale agreements either directly or through agent

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STATE STREET CORPORATION

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

banks, allowing borrowers the right of collateral substitution and/or short-notice termination. We revalue these securities daily to determine if additional collateral is necessary from the borrower to protect us against credit exposure. We can use these securities as collateral for repurchase agreements.

For securities sold under repurchase agreements collateralized by our investment securities portfolio, the dollar value of the securities remains in investment securities in our consolidated statement of condition. Where a master netting agreement exists or both parties are members of a common clearing organization, resale and repurchase agreements with the same counterparty or clearing house and maturity date are recorded on a net basis.

Fee and Net Interest Income

The majority of fees from investment servicing, investment management, securities finance, trading services and certain types of processing fees and other revenue are recorded in our consolidated statement of income based on the consideration specified in contracts with our customers, and excludes taxes collected from customers subsequently remitted to governmental authorities. We recognize revenue as the services are performed or at a point in time depending on the nature of the services provided. Payments made to third party service providers are generally recognized on a gross basis when we control those services and are deemed to be the principal. Additional information about revenue from contracts with customers is provided in Note 25.

Interest income on interest-earning assets and interest expense on interest-bearing liabilities are recorded in our consolidated statement of income as components of NII, and are generally based on the effective yield of the related financial asset or liability.

Other Significant Policies

The following table identifies our other significant accounting policies and the note and page where a detailed description of each policy can be found:

<u>Fair Value</u>	Note 2	Page <u>129</u>
<u>Investment Securities</u>	Note 3	Page <u>137</u>
<u>Loans and Leases</u>	Note 4	Page <u>145</u>
<u>Goodwill and Other Intangible Assets</u>	Note 5	Page <u>148</u>
<u>Derivative Financial Instruments</u>	Note 10	Page <u>152</u>
<u>Offsetting Arrangements</u>	Note 11	Page <u>157</u>
<u>Contingencies</u>	Note 13	Page <u>161</u>
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<u>Regulatory Capital</u>	Note 16	Page <u>167</u>
<u>Equity-Based Compensation</u>	Note 18	Page <u>169</u>
<u>Income Taxes</u>	Note 22	Page <u>172</u>
<u>Earnings Per Common Share</u>	Note 23	Page <u>175</u>
Revenue from Contracts with Customers	Note 25	Page <u>177</u>

Acquisitions and Dispositions

On October 1, 2018, we acquired a 100% interest in Charles River Development, a provider of investment management front office tools and solutions, for an all cash purchase price of approximately \$2.6 billion. We accounted for this acquisition as a business combination and, in accordance with ASC Topic 805, Business Combinations, we have recorded assets acquired and liabilities assumed at their respective fair values as of the acquisition date.

A significant portion of the purchase price is allocated to goodwill and identifiable intangible assets. Goodwill of \$1.5 billion, of which approximately \$1.4 billion is expected to be deductible for tax purposes, is attributable to revenue and cost synergies expected to arise from enhanced platform services and efficiencies, revenue growth from future product and service offerings and new customers, together with certain intangible assets that do not qualify for separate recognition. Identifiable intangible assets of \$1.0 billion arising from the acquisition are primarily related to technology and client relationships which are amortized on a straight line basis over a period of 10 and 18 years,

respectively. We determined the estimated fair value of identifiable intangible assets acquired by applying the income approach. Additional information about goodwill and other intangible assets, including information by line of business is provided in Note 5.

The purchase price accounting reflected in the accompanying financial statements is provisional and is based upon estimates and assumptions that are subject to change within the measurement period (up to one year from the acquisition date pursuant to ASC 805). The measurement period remains open pending the completion of valuation procedures related to the acquired assets and assumed liabilities, primarily the identifiable intangible assets.

Our consolidated financial statements include the operating results for the acquired business from the date of acquisition, October 1, 2018. Charles River Development contributed approximately \$121 million and \$57 million in total revenue and total expenses, respectively, for the year ended December 31, 2018.

Pro forma results of operations for this acquisition have not been presented because the effects would not have been material to our consolidated revenues or net income.

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STATE STREET CORPORATION

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Recent Accounting Developments

Relevant standards that were recently issued but not yet adopted as of December 31, 2018:

Standard	Description	Date of Adoption	Effects on the financial statements or other significant matters
ASU 2016-02, Leases (Topic 842) and relevant amendments	The standard represents a wholesale change to lease accounting and requires all leases, other than short-term leases, to be reported on balance sheet through recognition of a right-of-use asset and a corresponding liability for future lease obligations. The standard also requires extensive disclosures for assets, expenses, and cash flows associated with leases, as well as a maturity analysis of lease liabilities.	January 1, 2019	We have adopted the new standard as of January 1, 2019. Upon adoption of the standard, we recognized the required right-of-use assets of approximately \$0.9 billion and lease liabilities of approximately \$1.1 billion. This increase largely relates to the present value of future minimum lease payments due under existing operating leases of office space. No material changes are expected to the recognition of lease expenses in the Consolidated Statement of Income. We adopted the standard by applying the transition method whereby comparative periods will not be restated, and no material adjustment to retained earnings was required. For adoption we elected the standard's package of three practical expedients, and (1) have not reassessed whether any expired or existing contracts are or contain leases, (2) have not reassessed the lease classification for any expired or existing leases, and (3) have not reassessed initial direct costs for any existing leases. In addition, we made an accounting policy election not to apply the recognition requirements to short-term leases, and have elected the practical expedient to not separate lease and nonlease components.
ASU 2016-13, Financial Instruments-Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments	The standard replaces the existing incurred loss impairment guidance and requires immediate recognition of expected credit losses for financial assets carried at amortized cost, including trade and other receivables, loans and commitments, held-to-maturity debt securities and other financial assets, held at the reporting date to be measured based on historical experience, current conditions and reasonable supportable forecasts. The standard	January 1, 2020, early adoption permitted	We are continuing to assess the impact of the standard on our consolidated financial statements. We have established a steering committee to provide cross-functional governance over the project plan and key decisions, and are continuing to develop key accounting policies, assess existing credit loss models and processes against the new guidance and address data requirements and sources to ensure that the expected credit losses are calculated in accordance with the standard. We continue to develop and test new and modified credit

<p>ASU 2017-04, Intangibles-Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment</p>	<p>also amends existing impairment guidance for available-for-sale securities, and credit losses will be recorded as an allowance versus a write-down of the amortized cost basis of the security and will allow for a reversal of impairment loss when the credit of the issuer improves. The guidance requires a cumulative effect of initial application to be recognized in retained earnings at the date of initial application.</p> <p>The standard simplifies the subsequent measurement of goodwill by eliminating Step 2 from the goodwill impairment test. The ASU requires an entity to compare the fair value of a reporting unit with its carrying amount and recognize an impairment charge for the amount by which the carrying value exceeds the fair value of the reporting unit. Additionally, an entity should consider income tax effects from any tax deductible goodwill on the carrying amount of the reporting unit when measuring the goodwill impairment loss.</p>	<p>loss models and based on our analysis to date, we expect the recognition of credit losses to accelerate under the new standard. We are continuing to assess the extent of the impact on the allowance for credit losses which will be impacted by our portfolio and the macroeconomic factors on the date of adoption. We plan to adopt the new guidance on January 1, 2020.</p> <p>January 1, 2020, early adoption permitted</p> <p>We are evaluating the impacts of early adoption, and will apply this standard prospectively upon adoption.</p>
<p>ASU 2017-08, Receivables - Nonrefundable Fees and Other Costs (Subtopic 310-20): Premium amortization on Purchased Callable Debt Securities</p>	<p>The standard shortens the amortization period for certain purchased callable debt securities to the earliest call date. The standard does not impact debt securities which are held at a discount. The guidance requires a cumulative effect of initial application to be recognized in retained earnings at the beginning of the period of adoption.</p>	<p>January 1, 2019</p> <p>We have adopted the new standard as of January 1, 2019. No material adjustment to retained earnings was required.</p>
<p>ASU 2018-02, Income Statement - Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income</p>	<p>This standard provides an election to reclassify the stranded tax effects resulting from the enactment of the Tax Cuts and Jobs Act of 2017, from accumulated other comprehensive income to retained earnings.</p>	<p>January 1, 2019</p> <p>We have adopted the new standard as of January 1, 2019. Upon adoption of the standard we reclassified approximately \$84 million of stranded tax effects from accumulated other comprehensive income to retained earnings.</p>

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STATE STREET CORPORATION

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Relevant standards that were recently issued but not yet adopted as of December 31, 2018 (continued):

Standard	Description	Date of Adoption	Effects on the financial statements or other significant matters
ASU 2018-13, Fair Value Measurement (Topic 820): Disclosure Framework-Changes to the Disclosure Requirements for Fair Value Measurement	The standard eliminates, amends and adds disclosure requirements for fair value measurements.	January 1, 2020, early adoption permitted, including partial early adoption. Provisions that eliminate or amend disclosures can be early adopted without early adopting the new disclosure requirements.	We have elected to early adopt the provisions of the new standard that eliminate or amend disclosures as of December 31, 2018 and our disclosures were modified accordingly. The provisions of the new standard that add disclosures will be adopted upon the effective date of the standard.
ASU 2018-15, Intangibles-Goodwill and Other-Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract (a consensus of the FASB Emerging Issues Task Force)	This standard addresses accounting for fees paid by a customer for implementation, set-up and other upfront costs incurred in a cloud computing arrangement that is hosted by the vendor, i.e., a service contract. The new guidance aligns treatment for capitalization of implementation costs with guidance on internal-use software.	January 1, 2020, early adoption permitted	We are currently evaluating the impact of the new standard and the early adoption provisions.

Relevant standards that were adopted during the year ended December 31, 2018:

We adopted ASU 2014-09, Revenue from Contracts with Customers (Topic 606), effective January 1, 2018. The standard provides companies with a single model for recognizing revenue from contracts with customers. The core principle requires a company to recognize revenue to depict the transfer of goods or services to customers in an amount that reflects the consideration that it expects to be entitled to in exchange for those goods or services. We used the modified retrospective method of transition, which requires the impact of applying the standard on prior periods to be reflected in opening retained earnings upon adoption. The adoption of the standard does not have a material impact on the timing of recognition of revenue in our consolidated statement of income, or our consolidated statement of condition, and therefore no adjustment has been made to retained earnings. However, due to the updated principal and agent guidance in the standard, certain costs we pay to third parties on behalf of our clients previously reported in our consolidated statement of income on a net basis, primarily against the related management fee revenue and foreign exchange trading services revenue, are now reported on a gross basis in expenses.

For the year ended December 31, 2018, both revenues and expenses increased by approximately \$272 million, primarily due to the updated principal and agent guidance. The revenue impact was approximately \$190 million in management fees, \$58 million in foreign exchange trading services and \$24 million across other revenue lines, and the expense impact was approximately \$183 million in other expenses, \$59 million in transaction processing and \$30 million across other expense line items. Adoption of the standard had no impact on cash from or used in operating,

financing, or investing activities in our consolidated statements of cash flows.

We adopted ASU 2017-12, Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities, effective October 1, 2018. The standard amends the hedge accounting model to better portray the economics of risk management activities in the financial statements and enhances the presentation of hedge results. The amendments also make targeted changes to simplify the application of hedge accounting in certain situations. The guidance permits a one-time reclassification of debt securities eligible to be hedged under the "last-of-layer" method from HTM to AFS upon adoption. In the fourth quarter of 2018, we elected to make a one-time transfer of qualifying securities with a total book value of approximately \$1.2 billion. We have applied certain aspects of the updated standard to existing hedges as permitted by the ASU, however, the adoption did not have a material impact on our financial statements.

We adopted ASU 2016-01, Financial Instruments-Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities, effective January 1, 2018. Under the new standard, all equity securities will be measured at fair value through earnings with certain exceptions, including investments accounted for under the equity method of accounting or where the fair market value of an equity security is not readily available. Upon adoption of the standard on January 1, 2018, we reclassified approximately \$397 million of money market funds and \$46 million of equity securities classified as AFS to held at fair value through profit and loss in other assets. The cumulative-effect transition adjustment recognized in retained earnings on January 1, 2018, and the change in fair value recognized through profit and loss for the period ended December 31, 2018, were immaterial to the financial statements.

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Note 2. Fair Value

Fair Value Measurements

We carry trading account assets and liabilities, AFS debt securities, certain equity securities and various types of derivative financial instruments, at fair value in our consolidated statement of condition on a recurring basis. Changes in the fair values of these financial assets and liabilities are recorded either as components of our consolidated statement of income or as components of AOCI within shareholders' equity in our consolidated statement of condition. We measure fair value for the above-described financial assets and liabilities in conformity with U.S. GAAP that governs the measurement of the fair value of financial instruments. Management believes that its valuation techniques and underlying assumptions used to measure fair value conform to the provisions of U.S. GAAP. We categorize the financial assets and liabilities that we carry at fair value based on a prescribed three-level valuation hierarchy. The hierarchy gives the highest priority to quoted prices in active markets for identical assets or liabilities (level 1) and the lowest priority to valuation methods using significant unobservable inputs (level 3). If the inputs used to measure a financial asset or liability cross different levels of the hierarchy, categorization is based on the lowest-level input that is significant to the fair-value measurement. Management's assessment of the significance of a particular input to the overall fair-value measurement of a financial asset or liability requires judgment, and considers factors specific to that asset or liability. The three levels of the valuation hierarchy are described below.

Level 1. Financial assets and liabilities with values based on unadjusted quoted prices for identical assets or liabilities in an active market. Our level 1 financial assets and liabilities primarily include positions in U.S. government securities and highly liquid U.S. and non-U.S. government fixed-income securities. Our level 1 financial assets also include actively traded exchange-traded equity securities.

Level 2. Financial assets and liabilities with values based on quoted prices for similar assets and liabilities in active markets, and inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the asset or liability. Level 2 inputs include the following:

- Quoted prices for similar assets or liabilities in active markets;
- Quoted prices for identical or similar assets or liabilities in non-active markets;
- Pricing models whose inputs are observable for substantially the full term of the asset or liability; and

• Pricing models whose inputs are derived principally from, or corroborated by, observable market information through correlation or other means for substantially the full term of the asset or liability.

Our level 2 financial assets and liabilities primarily include non-U.S. debt securities carried in trading account assets and various types of fixed-income AFS investment securities, as well as various types of foreign exchange and interest rate derivative instruments.

Fair value for our AFS investment securities categorized in level 2 is measured primarily using information obtained from independent third parties. This third-party information is subject to review by management as part of a validation process, which includes obtaining an understanding of the underlying assumptions and the level of market participant information used to support those assumptions. In addition, management compares significant assumptions used by third parties to available market information. Such information may include known trades or, to the extent that trading activity is limited, comparisons to market research information pertaining to credit expectations, execution prices and the timing of cash flows and, where information is available, back-testing.

Derivative instruments categorized in level 2 predominantly represent foreign exchange contracts used in our trading activities, for which fair value is measured using discounted cash-flow techniques, with inputs consisting of observable spot and forward points, as well as observable interest rate curves. With respect to derivative instruments, we evaluate the impact on valuation of the credit risk of our counterparties. We consider factors such as the likelihood of default by our counterparties, our current and potential future net exposures and remaining maturities in determining the fair value. Valuation adjustments associated with derivative instruments were not material to those instruments for the years ended December 31, 2018 and 2017.

Level 3. Financial assets and liabilities with values based on prices or valuation techniques that require inputs that are both unobservable in the market and significant to the overall measurement of fair value. These inputs reflect management's judgment about the assumptions that a market participant would use in pricing the financial asset or liability, and are based on the best available information, some of which may be internally developed. The following provides a more detailed discussion of our financial assets and liabilities that we may categorize in level 3 and the related valuation methodology.

• The fair value of our investment securities categorized in level 3 is measured using information obtained from third-party sources,

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typically non-binding broker/dealer quotes, or through the use of internally-developed pricing models. Management has evaluated its methodologies used to measure fair value, and has considered the level of observable market information to be insufficient to categorize the securities in level 2.

The fair value of certain foreign exchange contracts, primarily options, is measured using an option-pricing model.

Because of a limited number of observable transactions, certain model inputs are not observable, such as implied volatility surface, but are derived from observable market information.

Our level 3 financial assets and liabilities are similar in structure and profile to our level 1 and level 2 financial instruments, but they trade in less liquid markets, and the measurement of their fair value is inherently less observable. The following tables present information with respect to our financial assets and liabilities carried at fair value in our consolidated statement of condition on a recurring basis as of the dates indicated.

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(In millions)	Fair Value Measurements on a Recurring Basis As of December 31, 2018				Total Net Carrying Value in Consolidated Statement of Condition
	Quoted Prices in Markets (Level 1)	Pricing Methods with Significant Observable Market Inputs (Level 2)	Pricing Methods with Significant Unobservable Market Inputs (Level 3)	Impact of Netting ⁽¹⁾	
Assets:					
Trading account assets:					
U.S. government securities	\$34	\$ —	\$ —		\$ 34
Non-U.S. government securities	146	179	—		325
Other	—	501	—		501
Total trading account assets	180	680	—		860
AFS investment securities:					
U.S. Treasury and federal agencies:					
Direct obligations	1,039	—	—		1,039
Mortgage-backed securities	—	15,968	—		15,968
Total U.S. Treasury and federal agencies	1,039	15,968	—		17,007
Asset-backed securities:					
Student loans	—	541	—		541
Credit cards	—	583	—		583
Collateralized loan obligations	—	—	593		593
Total asset-backed securities	—	1,124	593		1,717
Non-U.S. debt securities:					
Mortgage-backed securities	—	1,682	—		1,682
Asset-backed securities	—	943	631		1,574
Government securities	—	12,793	—		12,793
Other ⁽²⁾	—	6,544	58		6,602
Total non-U.S. debt securities	—	21,962	689		22,651
State and political subdivisions	—	1,918	—		1,918
Collateralized mortgage obligations	—	195	2		197
Other U.S. debt securities	—	1,658	—		1,658
Total AFS investment securities	1,039	42,825	1,284		45,148
Other assets:					
Derivative instruments:					
Foreign exchange contracts	—	16,382	4	\$(11,210)	5,176
Interest rate contracts	13	—	—	—	13
Total derivative instruments	13	16,382	4	(11,210)	5,189
Other	—	395	—	—	395
Total assets carried at fair value	\$1,232	\$ 60,282	\$ 1,288	\$(11,210)	\$ 51,592
Liabilities:					
Accrued expenses and other liabilities:					
Derivative instruments:					
Foreign exchange contracts	—	16,518	4	(11,564)	4,958
Interest rate contracts	—	71	—	—	71
Other derivative contracts	—	214	—	—	214

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Total derivative instruments	—	16,803	4	(11,564)	5,243
Total liabilities carried at fair value	\$—	\$ 16,803	\$ 4	\$(11,564)	\$ 5,243

⁽¹⁾ Represents counterparty netting against level 2 financial assets and liabilities where a legally enforceable master netting agreement exists between us and the counterparty. Netting also reflects asset and liability reductions of \$987 million and \$1,341 million, respectively, for cash collateral received from and provided to derivative counterparties.

⁽²⁾ As of December 31, 2018, the fair value of other non-U.S. debt securities included \$1,295 million of covered bonds and \$1,331 million of corporate bonds.

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Fair Value Measurements on a Recurring Basis
As of December 31, 2017

(In millions)	Quoted Market Prices in Active Markets (Level 1)	Pricing Methods with Significant Observable Market Inputs (Level 2)	Pricing Methods with Significant Unobservable Market Inputs (Level 3)	Impact of Netting ⁽¹⁾	Total Net Carrying Value in Consolidated Statement of Condition
Assets:					
Trading account assets:					
U.S. government securities	\$39	\$ —	\$ —		\$ 39
Non-U.S. government securities	389	93	—		482
Other	44	528	—		572
Total trading account assets	472	621	—		1,093
AFS investment securities:					
U.S. Treasury and federal agencies:					
Direct obligations	11	212	—		223
Mortgage-backed securities	—	10,872	—		10,872
Total U.S. Treasury and federal agencies	11	11,084	—		11,095
Asset-backed securities:					
Student loans	—	3,358	—		3,358
Credit cards	—	1,542	—		1,542
Collateralized loan obligations	—	89	1,358		1,447
Total asset-backed securities	—	4,989	1,358		6,347
Non-U.S. debt securities:					
Mortgage-backed securities	—	6,576	119		6,695
Asset-backed securities	—	2,545	402		2,947
Government securities	—	10,721	—		10,721
Other ⁽²⁾	—	5,904	204		6,108
Total non-U.S. debt securities	—	25,746	725		26,471
State and political subdivisions	—	9,108	43		9,151
Collateralized mortgage obligations	—	1,054	—		1,054
Other U.S. debt securities	—	2,560	—		2,560
U.S. equity securities	—	46	—		46
U.S. money-market mutual funds	—	397	—		397
Total AFS investment securities	11	54,984	2,126		57,121
Other assets:					
Derivatives instruments:					
Foreign exchange contracts	—	11,596	1	\$(7,593)	4,004
Interest rate contracts	8	—	—	—	8
Other derivative contracts	1	—	—	—	1
Total derivative instruments	9	11,596	1	(7,593)	4,013
Total assets carried at fair value	\$492	\$ 67,201	\$ 2,127	\$(7,593)	\$ 62,227
Liabilities:					
Accrued expenses and other liabilities:					
Trading account liabilities:					
Other	\$39	\$ —	\$ —	\$ —	\$ 39

Derivative instruments:

Foreign exchange contracts	—	11,467	1	(5,970)	5,498
Interest rate contracts	—	100	—	—	100
Other derivative contracts	1	283	—	—	284
Total derivative instruments	1	11,850	1	(5,970)	5,882
Total liabilities carried at fair value	\$40	\$ 11,850	\$ 1	\$(5,970)	\$ 5,921

⁽¹⁾ Represents counterparty netting against level 2 financial assets and liabilities where a legally enforceable master netting agreement exists between us and the counterparty. Netting also reflects asset and liability reductions of \$2,045 million and \$422 million, respectively, for cash collateral received from and provided to derivative counterparties.

⁽²⁾ As of December 31, 2017, the fair value of other non-U.S. debt securities was primarily composed of \$3,537 million of covered bonds and \$1,885 million of corporate bonds.

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The following tables present activity related to our level 3 financial assets during the years ended December 31, 2018 and 2017, respectively. Transfers into and out of level 3 are reported as of the beginning of the period presented. During the years ended December 31, 2018 and 2017, transfers into level 3 were mainly related to certain CMO, MBS and ABS, including non-U.S. debt securities, for which fair value was measured using information obtained from third-party sources, including non-binding broker/dealer quotes. During the years ended December 31, 2018 and 2017, transfers out of level 3 were mainly related to certain CMO, MBS and ABS, including non-U.S. debt securities, for which fair value was measured using prices for which observable market information became available.

Fair Value Measurements Using Significant Unobservable Inputs

Year Ended December 31, 2018

(In millions)	Fair Value as of December 31, 2017	Recorded in Revenue	Recorded in Other Comprehensive Income ⁽¹⁾	Total Realized and Unrealized Gains (Losses)		Purchases	Sales	Settlements	Transfers into Level 3	Transfers out of Level 3	Fair Value as of December 31, 2018 ⁽¹⁾	Change in Unrealized Gains (Losses) Related to Financial Instruments Held as of December 31, 2018
Assets:												
AFS Investment securities:												
Asset-backed securities:												
Collateralized loan obligations												
	\$1,358	\$ 4	\$ (7)	\$ 351	\$ (636)	\$ (268)	\$ —	\$ (209)	\$ 593			
Total asset-backed securities	1,358	4	(7)	351	(636)	(268)	—	(209)	593			
Non-U.S. debt securities:												
Mortgage-backed securities												
	119	—	—	—	—	—	—	(119)	—			
Asset-backed securities	402	—	(4)	495	(310)	(66)	114	—	631			
Other	204	—	—	13	(59)	(36)	—	(64)	58			
Total non-U.S. debt securities	725	—	(4)	508	(369)	(102)	114	(183)	689			
State and political subdivisions	43	—	—	—	(37)	(1)	—	(5)	—			
Collateralized mortgage obligations	—	—	—	—	—	(6)	8	—	2			
Total AFS investment securities	2,126	4	(11)	859	(1,042)	(377)	122	(397)	1,284			
Derivative instruments:												
	1	(3)	—	6	—	—	—	—	4	\$ (3)		

Foreign exchange
contracts

Total derivative instruments	1	(3)	—	6	—	—	—	—	4	(3)
Total assets carried at fair value	\$2,127	\$ 1	\$ (11)	\$ 865	\$(1,042)	\$(377)	\$ 122	\$(397)	\$ 1,288	\$ (3)

⁽¹⁾ Total realized and unrealized gains (losses) on AFS investment securities are included within gains (losses) related to investment securities, net. Total realized and unrealized gains (losses) on derivative instruments are included within foreign exchange trading services.

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Fair Value Measurements Using Significant Unobservable Inputs
Year Ended December 31, 2017

(In millions)	Total Realized and Unrealized Gains (Losses)							Fair Value as of December 31, 2017 ⁽¹⁾	Change in Unrealized Gains (Losses) Related to Financial Instruments Held as of December 31, 2017
	Fair Value as of December 31, 2016	Recorded in Revenue	Recorded in Other Comprehensive Income ⁽¹⁾	Purchases	Sales	Settlements	Transfers into Level 3		
Assets:									
AFS Investment securities:									
U.S. Treasury and federal agencies:									
Mortgage-backed securities	\$—	\$ —	\$ —	\$—	\$—	\$—	\$ 25	\$(25)	\$—
Asset-backed securities:									
Student loans	97	—	1	200	—	—	—	(298)	—
Other	905	3	—	1,035	(240)	(620)	275	—	1,358
Total asset-backed securities	1,002	3	1	1,235	(240)	(620)	275	(298)	1,358
Non-U.S. debt securities:									
Mortgage-backed securities	—	—	(2)	119	—	2	—	—	119
Asset-backed securities	32	1	—	370	(10)	(11)	67	(47)	402
Other	248	—	1	5	(81)	31	—	—	204
Total non-U.S. debt securities	280	1	(1)	494	(91)	22	67	(47)	725
State and political subdivisions	39	—	2	—	—	(3)	5	—	43
Collateralized mortgage obligations	16	—	(1)	24	—	—	—	(39)	—
Other U.S. debt securities	—	—	—	19	(19)	—	—	—	—
Total AFS investment securities	1,337	4	1	1,772	(350)	(601)	372	(409)	2,126
Other assets:									
Derivative instruments:									
Foreign exchange contracts	8	(7)	—	4	—	(4)	—	—	1
									\$ (3)

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Total derivative instruments	8	(7)	—	4	—	(4)	—	—	1	(3)
Total assets carried at fair value	\$1,345	\$ (3)	\$ 1	\$ 1,776	\$(350)	\$(605)	\$ 372	\$(409)	\$ 2,127	\$ (3)

(1) Total realized and unrealized gains (losses) on AFS investment securities are included within gains (losses) related to investment securities, net. Total realized and unrealized gains (losses) on derivative instruments are included within foreign exchange trading services.

The following table presents quantitative information, as of the dates indicated, about the valuation techniques and significant unobservable inputs used in the valuation of our level 3 financial assets and liabilities measured at fair value on a recurring basis for which we use internally-developed pricing models. The significant unobservable inputs for our level 3 financial assets and liabilities whose fair value is measured using pricing information from non-binding broker/dealer quotes are not included in the table, as the specific inputs applied are not provided by the broker/dealer.

(Dollars in millions)	Quantitative Information about Level 3 Fair Value Measurements						
	Fair Value			Valuation Technique	Significant Unobservable Input ⁽¹⁾	Weighted-Average	
	As of December 31, 2018	As of December 31, 2017				As of December 31, 2018	As of December 31, 2017
Significant unobservable inputs readily available to State Street:							
Assets:							
Derivative Instruments, foreign exchange contracts	\$4	\$ 1	Option model	Volatility	11.4 %	7.2 %	
Total	\$4	\$ 1					
Liabilities:							
Derivative instruments, foreign exchange contracts	\$4	\$ 1	Option model	Volatility	11.4 %	7.2 %	
Total	\$4	\$ 1					

(1) Significant changes in these unobservable inputs may result in significant changes in fair value measurement of the derivative instrument.

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Financial Instruments Not Carried at Fair Value

Estimates of fair value for financial instruments not carried at fair value on a recurring basis in our consolidated statement of condition are generally subjective in nature, and are determined as of a specific point in time based on the characteristics of the financial instruments and relevant market information. Disclosure of fair value estimates is not required by U.S. GAAP for certain items, such as lease financing, equity-method investments, obligations for pension and other post-retirement plans, premises and equipment, other intangible assets and income-tax assets and liabilities. Accordingly, aggregate fair-value estimates presented do not purport to represent, and should not be considered representative of, our underlying “market” or franchise value. In addition, because of potential differences in methodologies and assumptions used to estimate fair values, our estimates of fair value should not be compared to those of other financial institutions.

We use the following methods to estimate the fair values of our financial instruments:

- For financial instruments that have quoted market prices, those quoted prices are used to estimate fair value;
- For financial instruments that have no defined maturity, have a remaining maturity of 180 days or less, or repriced frequently to a market rate, we assume that the fair value of these instruments approximates their reported value, after taking into consideration any applicable credit risk; and
- For financial instruments for which no quoted market prices are available, fair value is estimated

using information obtained from independent third parties, or by discounting the expected cash flows using an estimated current market interest rate for the financial instrument.

The generally short duration of certain of our assets and liabilities results in a significant number of financial instruments for which fair value equals or closely approximates the amount recorded in our consolidated statement of condition. These financial instruments are reported in the following captions in our consolidated statement of condition: cash and due from banks; interest-bearing deposits with banks; securities purchased under resale agreements; accrued interest and fees receivable; deposits; securities sold under repurchase agreements; and other short-term borrowings.

In addition, due to the relatively short duration of certain of our loans, we consider fair value for these loans to approximate their reported value. The fair value of other types of loans, such as senior secured bank loans, commercial real estate loans, purchased receivables and municipal loans is estimated using information obtained from independent third parties or by discounting expected future cash flows using current rates at which similar loans would be made to borrowers with similar credit ratings for the same remaining maturities. Commitments to lend have no reported value because their terms are at prevailing market rates.

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The following tables present the reported amounts and estimated fair values of the financial assets and liabilities not carried at fair value on a recurring basis, as they would be categorized within the fair value hierarchy, as of the dates indicated.

(In millions)	Reported Amount	Estimated Fair Value	Fair Value Hierarchy		
			Quoted Prices in Active Markets (Level 1)	Market Pricing Methods with Significant Observable Market Inputs (Level 2)	Pricing Methods with Significant Unobservable Market Inputs (Level 3)
December 31, 2018					
Financial Assets:					
Cash and due from banks	\$ 3,597	\$ 3,597	\$ 3,597	\$ —	\$ —
Interest-bearing deposits with banks	73,040	73,040	—	73,040	—
Securities purchased under resale agreements	4,679	4,679	—	4,679	—
Investment securities held-to-maturity	41,914	41,351	14,541	26,688	122
Net loans (excluding leases) ⁽¹⁾	25,722	25,561	—	24,648	913
Other ⁽²⁾	8,500	8,500	—	8,500	—
Financial Liabilities:					
Deposits:					
Non-interest-bearing	\$ 44,804	\$ 44,804	\$ —	\$ 44,804	\$ —
Interest-bearing - U.S.	66,235	66,235	—	66,235	—
Interest-bearing - non-U.S.	69,321	69,321	—	69,321	—
Securities sold under repurchase agreements	1,082	1,082	—	1,082	—
Other short-term borrowings	3,092	3,092	—	3,092	—
Long-term debt	11,093	11,048	—	10,865	183
Other ⁽²⁾	8,500	8,500	—	8,500	—

⁽¹⁾ Includes \$10 million of loans classified as held-for-sale that were measured at fair value on a non-recurring basis as of December 31, 2018.

⁽²⁾ Represents a portion of underlying client assets related to our enhanced custody business, which clients have allowed us to transfer and re-pledge.

(In millions)	Reported Amount	Estimated Fair Value	Fair Value Hierarchy		
			Quoted Prices in Active Markets (Level 1)	Market Pricing Methods with Significant Observable Market Inputs (Level 2)	Pricing Methods with Significant Unobservable Market Inputs (Level 3)
December 31, 2017					
Financial Assets:					
Cash and due from banks	\$ 2,107	\$ 2,107	\$ 2,107	\$ —	\$ —
Interest-bearing deposits with banks	67,227	67,227	—	67,227	—
Securities purchased under resale agreements	3,241	3,241	—	3,241	—
Investment securities held-to-maturity	40,458	40,255	16,814	23,318	123
Net loans (excluding leases) ⁽¹⁾	22,577	22,482	—	22,431	51
Financial Liabilities:					
Deposits:					
Non-interest-bearing	\$ 47,175	\$ 47,175	\$ —	\$ 47,175	\$ —

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Interest-bearing - U.S.	50,139	50,139	—	50,139	—
Interest-bearing - non-U.S.	87,582	87,582	—	87,582	—
Securities sold under repurchase agreements	2,842	2,842	—	2,842	—
Other short-term borrowings	1,144	1,144	—	1,144	—
Long-term debt	11,620	11,919	—	11,639	280

⁽¹⁾ Includes \$3 million of loans classified as held-for-sale that were measured at fair value on a non-recurring basis as of December 31, 2017.

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Note 3. Investment Securities

Investment securities held by us are classified as either trading account assets, AFS, HTM or equity securities held at fair value at the time of purchase and reassessed periodically, based on management's intent.

As described in Note 1, upon adoption of ASU 2016-01 in 2018, we reclassified approximately \$397 million of money market funds and \$46 million of equity securities to other assets, where they are held at fair value with changes to fair value recorded through our consolidated statement of income.

Generally, trading assets are debt and equity securities purchased in connection with our trading activities and, as such, are expected to be sold in the near term. Our trading activities typically involve active and frequent buying and selling with the objective of generating profits on short-term movements. AFS investment securities are those securities that we intend to hold for an indefinite period of time. AFS investment

securities include securities utilized as part of our asset and liability management activities that may be sold in response to changes in interest rates, prepayment risk, liquidity needs or other factors. HTM securities are debt securities that management has the intent and the ability to hold to maturity.

Trading assets are carried at fair value. Both realized and unrealized gains and losses on trading assets are recorded in foreign exchange trading services revenue in our consolidated statement of income. AFS securities are carried at fair value, and after-tax net unrealized gains and losses are recorded in AOCI. Gains or losses realized on sales of AFS investment securities are computed using the specific identification method and are recorded in gains (losses) related to investment securities, net, in our consolidated statement of income. HTM investment securities are carried at cost, adjusted for amortization of premiums and accretion of discounts.

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The following table presents the amortized cost, fair value and associated unrealized gains and losses of AFS and HTM investment securities as of the dates indicated:

(In millions)	December 31, 2018			December 31, 2017			Fair Value	Fair Value
	Amortized Cost	Gross Unrealized Gains	Unrealized Losses	Amortized Cost	Gross Unrealized Gains	Unrealized Losses		
Available-for-sale:								
U.S. Treasury and federal agencies:								
Direct obligations	\$1,035	\$4	\$ —	\$1,039	\$222	\$2	\$ 1	\$223
Mortgage-backed securities	16,112	37	181	15,968	10,975	26	129	10,872
Total U.S. Treasury and federal agencies	17,147	41	181	17,007	11,197	28	130	11,095
Asset-backed securities:								
Student loans ⁽¹⁾	538	4	1	541	3,325	37	4	3,358
Credit cards	609	—	26	583	1,565	2	25	1,542
Collateralized loan obligations	594	1	2	593	1,440	7	—	1,447
Total asset-backed securities	1,741	5	29	1,717	6,330	46	29	6,347
Non-U.S. debt securities:								
Mortgage-backed securities	1,687	—	5	1,682	6,664	36	5	6,695
Asset-backed securities	1,580	—	6	1,574	2,942	5	—	2,947
Government securities	12,816	22	45	12,793	10,754	16	49	10,721
Other ⁽²⁾	6,600	18	16	6,602	6,076	38	6	6,108
Total non-U.S. debt securities	22,683	40	72	22,651	26,436	95	60	26,471
State and political subdivisions ⁽³⁾	1,905	20	7	1,918	8,929	245	23	9,151
Collateralized mortgage obligations	200	—	3	197	1,060	3	9	1,054
Other U.S. debt securities	1,683	1	26	1,658	2,563	12	15	2,560
U.S. equity securities ⁽⁴⁾	—	—	—	—	40	8	2	46
U.S. money-market mutual funds ⁽⁴⁾	—	—	—	—	397	—	—	397
Total	\$45,359	\$107	\$ 318	\$45,148	\$56,952	\$437	\$ 268	\$57,121
Held-to-maturity:								
U.S. Treasury and federal agencies:								
Direct obligations	\$14,794	\$—	\$ 199	\$14,595	\$17,028	\$—	\$ 143	\$16,885
Mortgage-backed securities	21,647	24	518	21,153	16,651	22	225	16,448
Total U.S. Treasury and federal agencies	36,441	24	717	35,748	33,679	22	368	33,333
Asset-backed securities:								
Student loans ⁽¹⁾	3,191	35	10	3,216	3,047	32	9	3,070
Credit cards	193	—	—	193	798	2	—	800
Other	1	—	—	1	1	—	—	1
Total asset-backed securities	3,385	35	10	3,410	3,846	34	9	3,871
Non-U.S. debt securities:								
Mortgage-backed securities	638	77	9	706	939	82	6	1,015
Asset-backed securities	223	—	—	223	263	1	—	264
Government securities	358	1	—	359	474	2	—	476
Other	46	—	—	46	48	—	—	48
Total non-U.S. debt securities	1,265	78	9	1,334	1,724	85	6	1,803
Collateralized mortgage obligations	823	38	2	859	1,209	45	6	1,248
Total	\$41,914	\$175	\$ 738	\$41,351	\$40,458	\$186	\$ 389	\$40,255

(1) Primarily comprised of securities guaranteed by the federal government with respect to at least 97% of defaulted principal and accrued interest on the underlying loans.

(2) As of December 31, 2018 and December 31, 2017, the fair value of other non-U.S. debt securities included \$1,295 million and \$3,537 million, respectively, of covered bonds and \$1,331 million and \$1,885 million, respectively, of corporate bonds.

(3) As of December 31, 2018 and December 31, 2017, the fair value of state and political subdivisions includes securities in trusts of \$1,052 million and \$1,247 million, respectively. Additional information about these trusts is provided in Note 14.

(4) As described in Note 1 to the consolidated financial statements in this Form 10-K, upon adoption of ASU 2016-01 in 2018, we reclassified money-market funds and equity securities classified as AFS to held at fair value through profit and loss in other assets.

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Aggregate investment securities with carrying values of approximately \$39 billion and \$48 billion as of December 31, 2018 and December 31, 2017, respectively, were designated as pledged for public and trust deposits, short-term borrowings and for other purposes as provided by law.

In 2018, \$1.2 billion of HTM securities, primarily consisting of MBS and CMBS, were transferred to AFS at book value and sold at a pre-tax loss of approximately \$36 million, due to our election to make a one-time transfer of securities relating to the adoption of ASU 2017-12. Additional information on this new standard is provided in Note 1. In 2018, we sold approximately \$26 billion of AFS securities, primarily ABS and municipal bonds, resulting in a net pre-tax gain of approximately \$9 million. In 2017, we sold \$12.2 billion of AFS securities, primarily agency MBS and U.S. treasury securities in our investment portfolio, to position for the then existing interest rate environment resulting in a pre-tax loss of \$39 million.

In 2018 and 2017, \$2.1 billion and \$496 million, respectively, of agency MBS, previously classified as AFS, were transferred to HTM. This transfer reflects our intent to hold these securities until their maturity. These securities were transferred at fair value, which included a net unrealized loss of \$53 million and \$2.8 million as of December 31, 2018 and 2017, respectively, within accumulated other comprehensive loss which will be accreted into interest income over the remaining life of the transferred security (ranging from approximately 10 to 42 years).

The following tables present the aggregate fair values of AFS and HTM investment securities that have been in a continuous unrealized loss position for less than 12 months, and those that have been in a continuous unrealized loss position for 12 months or longer, as of the dates indicated:

December 31, 2018 (In millions)	Less than 12 months		12 months or longer		Total	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
Available-for-sale:						
U.S. Treasury and federal agencies:						
Mortgage-backed securities	\$5,058	\$ 21	\$5,089	\$ 160	\$10,147	\$ 181
Total U.S. Treasury and federal agencies	5,058	21	5,089	160	10,147	181
Asset-backed securities:						
Student loans	106	—	218	1	324	1
Credit cards	90	—	493	26	583	26
Collateralized loan obligations	548	2	—	—	548	2
Total asset-backed securities	744	2	711	27	1,455	29
Non-U.S. debt securities:						
Mortgage-backed securities	1,407	4	118	1	1,525	5
Asset-backed securities	1,479	6	—	—	1,479	6
Government securities	5,478	45	—	—	5,478	45
Other	2,167	12	226	4	2,393	16
Total non-U.S. debt securities	10,531	67	344	5	10,875	72
State and political subdivisions	365	3	244	4	609	7
Collateralized mortgage obligations	181	3	14	—	195	3
Other U.S. debt securities	861	14	484	12	1,345	26
Total	\$17,740	\$ 110	\$6,886	\$ 208	\$24,626	\$ 318
Held-to-maturity:						
U.S. Treasury and federal agencies:						
Direct obligations	\$2,192	\$ 45	\$12,403	\$ 154	\$14,595	\$ 199
Mortgage-backed securities	6,502	103	10,648	415	17,150	518
Total U.S. Treasury and federal agencies	8,694	148	23,051	569	31,745	717

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Asset-backed securities:							
Student loans	481	4	536	6	1,017	10	
Total asset-backed securities	481	4	536	6	1,017	10	
Non-U.S. debt securities:							
Mortgage-backed securities	184	2	119	7	303	9	
Total non-U.S. debt securities	184	2	119	7	303	9	
Collateralized mortgage obligations	102	1	51	1	153	2	
Total	\$9,461	\$ 155	\$23,757	\$ 583	\$33,218	\$ 738	

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December 31, 2017 (In millions)	Less than 12 months		12 months or longer		Total	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
Available-for-sale:						
U.S. Treasury and federal agencies:						
Direct obligations	\$—	\$ —	\$67	\$ 1	\$67	\$ 1
Mortgage-backed securities	5,161	31	3,341	98	8,502	129
Total U.S. Treasury and federal agencies	5,161	31	3,408	99	8,569	130
Asset-backed securities:						
Student loans	—	—	769	4	769	4
Credit cards	1,289	25	—	—	1,289	25
Total asset-backed securities	1,289	25	769	4	2,058	29
Non-U.S. debt securities:						
Mortgage-backed securities	1,059	4	469	1	1,528	5
Government securities	7,629	48	68	1	7,697	49
Other	816	4	289	2	1,105	6
Total non-U.S. debt securities	9,504	56	826	4	10,330	60
State and political subdivisions	734	6	901	17	1,635	23
Collateralized mortgage obligations	399	5	136	4	535	9
Other U.S. debt securities	1,007	8	345	7	1,352	15
U.S. equity securities	—	—	6	2	6	2
Total	\$18,094	\$ 131	\$6,391	\$ 137	\$24,485	\$ 268
Held-to-maturity:						
U.S. Treasury and federal agencies:						
Direct obligations	\$14,439	\$ 109	\$2,447	\$ 34	\$16,886	\$ 143
Mortgage-backed securities	6,785	38	5,988	187	12,773	225
Total U.S. Treasury and federal agencies	21,224	147	8,435	221	29,659	368
Asset-backed securities:						
Student loans	440	3	423	6	863	9
Total asset-backed securities	440	3	423	6	863	9
Non-U.S. debt securities:						
Mortgage-backed securities	—	—	239	6	239	6
Total non-U.S. debt securities	—	—	239	6	239	6
Collateralized mortgage obligations	—	—	276	6	276	6
Total	\$21,664	\$ 150	\$9,373	\$ 239	\$31,037	\$ 389

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The following table presents contractual maturities of debt investment securities by carrying amount as of December 31, 2018. The maturities of certain ABS, MBS, and CMOs are based on expected principal payments. Actual maturities may differ from these expected maturities since certain borrowers have the right to prepay obligations with or without prepayment penalties.

December 31, 2018 (In millions)	Under 1 Year	1 to 5 Years	6 to 10 Years	Over 10 Years	Total
Available-for-sale:					
U.S. Treasury and federal agencies:					
Direct obligations	\$ 224	\$ 815	\$—	\$—	\$1,039
Mortgage-backed securities	101	802	1,884	13,181	15,968
Total U.S. Treasury and federal agencies	325	1,617	1,884	13,181	17,007
Asset-backed securities:					
Student loans	57	164	250	70	541
Credit cards	199	294	90	—	583
Collateralized loan obligations	—	402	171	20	593
Total asset-backed securities	256	860	511	90	1,717
Non-U.S. debt securities:					
Mortgage-backed securities	139	769	176	598	1,682
Asset-backed securities	136	698	581	159	1,574
Government securities	3,439	6,409	2,945	—	12,793
Other	1,071	4,575	937	19	6,602
Total non-U.S. debt securities	4,785	12,451	4,639	776	22,651
State and political subdivisions	235	776	446	461	1,918
Collateralized mortgage obligations	2	—	—	195	197
Other U.S. debt securities	141	1,219	298	—	1,658
Total	\$ 5,744	\$ 16,923	\$ 7,778	\$ 14,703	\$ 45,148
Held-to-maturity:					
U.S. Treasury and federal agencies:					
Direct obligations	\$ 4,002	\$ 10,737	\$ 12	\$ 43	\$ 14,794
Mortgage-backed securities	33	127	1,697	19,790	21,647
Total U.S. Treasury and federal agencies	4,035	10,864	1,709	19,833	36,441
Asset-backed securities:					
Student loans	7	291	267	2,626	3,191
Credit cards	58	135	—	—	193
Other	—	—	—	1	1
Total asset-backed securities	65	426	267	2,627	3,385
Non-U.S. debt securities:					
Mortgage-backed securities	160	42	7	429	638
Asset-backed securities	96	127	—	—	223
Government securities	243	115	—	—	358
Other	46	—	—	—	46
Total non-U.S. debt securities	545	284	7	429	1,265
Collateralized mortgage obligations	1	318	15	489	823
Total	\$ 4,646	\$ 11,892	\$ 1,998	\$ 23,378	\$ 41,914

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The following tables present gross realized gains and losses from sales of AFS investment securities, and the components of net impairment losses included in net gains and losses related to investment securities for the periods indicated.

(In millions)	Years Ended		
	December 31,		
	2018	2017	2016
Gross realized gains from sales of AFS investment securities	\$205	\$74	\$15
Gross realized losses from sales of AFS investment securities	(196)	(113)	(5)
Net impairment losses:			
Gross losses from OTTI	(3)	—	(2)
Losses reclassified (from) to other comprehensive income	—	—	(1)
Net impairment losses ⁽¹⁾	(3)	—	(3)
Gains (losses) related to investment securities, net	\$6	\$(39)	\$7

⁽¹⁾ Net impairment losses, recognized in our consolidated statement of income, were composed of the following:

Impairment associated with expected credit losses	\$—	\$—	\$(1)
Impairment associated with adverse changes in timing of expected future cash flows	(3)	—	(2)
Net impairment losses	\$(3)	\$—	\$(3)

The following table presents a roll-forward with respect to net impairment losses that have been recognized in income for the periods indicated.

(In millions)	Years Ended		
	December 31,		
	2018	2017	2016
Balance, beginning of period	\$77	\$79	\$105
Additions ⁽¹⁾ :			
OTTI recognized	3	—	2
Deductions ⁽²⁾ :			
Realized losses on securities sold or matured	(2)	(2)	(28)
Balance, end of period	\$78	\$77	\$79

⁽¹⁾ Additions represent securities with a first time credit impairment realized or when a subsequent credit impairment has occurred.

⁽²⁾ Deductions represent impairments on securities that have been sold or matured, are required to be sold, or for which management intends to sell.

Interest income related to debt securities is recognized in our consolidated statement of income using the effective interest method, or on a basis approximating a level rate of return over the contractual or estimated life of the security. The level rate of return considers any non-refundable fees or costs, as well as purchase premiums or discounts, resulting in amortization or accretion, accordingly.

For certain debt securities acquired which are considered to be beneficial interests in securitized financial assets, the excess of our estimate of undiscounted future cash flows from these securities over their initial recorded investment is accreted into interest income on a level-yield basis over the securities' estimated remaining terms. Subsequent decreases in these securities' expected future cash flows are either

recognized prospectively through an adjustment of the yields on the securities over their remaining terms, or are evaluated for OTTI. Increases in expected future cash flows are recognized prospectively over the securities' estimated remaining terms through the recalculation of their yields.

Impairment

We conduct periodic reviews of individual securities to assess whether OTTI exists. Impairment exists when the current fair value of an individual security is below its amortized cost basis. For AFS and HTM debt securities, impairment is recorded in our consolidated statement of income when management intends to sell (or may be required to sell) the securities before they recover in value, or when management expects the present value of cash flows expected to be collected from the securities to be less than the amortized cost of the impaired security (a credit loss).

Our review of impaired securities generally includes:

- the identification and evaluation of securities that have indications of potential OTTI, such as issuer-specific concerns, including deteriorating financial condition or bankruptcy;
- the analysis of expected future cash flows of securities, based on quantitative and qualitative factors;
- the analysis of the collectability of those future cash flows, including information about past events, current conditions, and reasonable and supportable forecasts;
- the analysis of the underlying collateral for MBS and ABS;
- the analysis of individual impaired securities, including consideration of the length of time the security has been in an unrealized loss position, the anticipated recovery period, and the magnitude of the overall price decline;
- evaluation of factors or triggers that could cause individual securities to be deemed OTTI and those that would not support OTTI; and
- documentation of the results of these analyses.

Factors considered in determining whether impairment is other than temporary include:

- certain macroeconomic drivers;
- certain industry-specific drivers;
- the length of time the security has been impaired;
- the severity of the impairment;
- the cause of the impairment and the financial condition and near-term prospects of the issuer;

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activity in the market with respect to the issuer's securities, which may indicate adverse credit conditions; and our intention not to sell, and the likelihood that we will not be required to sell, the security for a period of time sufficient to allow for its recovery in value.

Substantially all of our investment securities portfolio is composed of debt securities. A critical component of our assessment of OTTI of these debt securities is the identification of credit-impaired securities for which management does not expect to receive cash flows sufficient to recover the entire amortized cost basis of the security.

Debt securities that are not deemed to be credit-impaired are subject to additional management analysis to assess whether management intends to sell, or, more likely than not, would be required to sell, the security before the expected recovery of its amortized cost basis.

The following provides a description of our process for the identification and assessment of OTTI, as well as information about OTTI recorded in 2018, 2017 and 2016 and changes in period-end unrealized losses, for major security types as of December 31, 2018.

U.S. Agency Securities

Our portfolio of U.S. agency direct obligations and MBS receives the implicit or explicit backing of the U.S. government in conjunction with specified financial support of the U.S. Treasury. We recorded no OTTI on these securities in 2018, 2017 or 2016.

The overall increase in unrealized losses on these securities as of December 31, 2018 was primarily attributable to interest rate increases in 2018 and to an increase in total U.S. agency securities during 2018.

Asset-Backed Securities - Student Loans

Asset-backed securities collateralized by student loans are primarily composed of securities collateralized by FFELP loans. FFELP loans benefit from a federal government guarantee of at least 97% of defaulted principal and accrued interest, with additional credit support provided to our securities in the form of over-collateralization, subordination and excess spread, which collectively total in excess of 100%. Accordingly, the vast majority of FFELP loan-backed securities are protected from traditional consumer credit risk. We recorded no OTTI on these securities in 2018, 2017 or 2016.

Our assessment of OTTI of these securities considers, among many other factors, the strength of the U.S. government guarantee, the performance of the underlying collateral, and the remaining average term of the FFELP loan-backed securities portfolio, which was approximately 5.0 years as of December 31, 2018.

In general, the rating agencies have largely completed their downgrade review of FFELP loan-backed securities due to potential extension of student loan repayments beyond the securities' legal final maturity dates. At this time, we do not expect a significant number of additional downgrades related to potential legal final maturity breaches. Based on the limited price impact on the overall FFELP loan-backed securities portfolio and recent remedial actions by issuers, including amending loan-backed securities' maturity dates and exercising cleanup calls, the credit quality of the FFELP loan-backed securities portfolio remains stable and we, as a bondholder, remain protected from principal loss as a result of the aforementioned federal government guarantee and over-collateralization. Downside risks remain should remedial actions fail to address the extension risks.

Our total exposure to private student loan-backed securities was less than \$4 million as of December 31, 2018. Our assessment of OTTI of private student loan-backed securities considers, among other factors, the impact of high unemployment rates on the collateral performance of private student loans. We recorded no OTTI on these securities in 2018, 2017 or 2016.

Non-U.S. Mortgage- and Asset-Backed Securities

Non-U.S. mortgage- and asset-backed securities are primarily composed of U.K., Australian and Dutch securities collateralized by residential mortgages and German and U.K. securities collateralized by automobile loans and leases. Our assessment of impairment with respect to these securities considers the location of the underlying collateral, collateral enhancement and structural features, expected credit losses under base-case and stressed conditions and the macroeconomic outlook for the country in which the collateral is located, including housing prices and

unemployment. Where appropriate, any potential loss after consideration of the above-referenced factors is further evaluated to determine whether any OTTI exists.

We recorded OTTI of \$3 million, less than \$1 million and \$2 million in 2018, 2017 and 2016, respectively, on non-U.S. residential MBS, which resulted from adverse changes in the timing of expected future cash flows from the securities.

Our assessment of OTTI of these securities takes into account government intervention in the corresponding mortgage markets and assumes a baseline macroeconomic environment for this region, factoring in slower economic growth and continued government austerity measures. In addition, we perform stress testing and sensitivity analysis in order to understand the impact of more severe assumptions on potential OTTI.

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State and Political Subdivisions and Other U.S. Debt Securities

Our municipal securities portfolio primarily includes securities issued by U.S. states and their municipalities. A portion of this portfolio is held in connection with our tax-exempt investment program, more fully described in Note 14. Our portfolio of other U.S. debt securities is primarily composed of securities issued by U.S. corporations. Our assessment of OTTI of these portfolios considers, among other factors, adverse conditions specifically related to the geographic area or financial condition of the issuer; the structure of the security, including collateral, if any, and payment schedule; rating agency changes to the security's credit rating; the volatility of the fair value changes; and our intent and ability to hold the security until its recovery in value. If the impairment of the security is credit-related, we estimate the future cash flows from the security, tailored to the security and considering the above-described factors, and any resulting impairment deemed to be other-than-temporary is recorded in our consolidated statement of income. We recorded no OTTI on these securities in 2018, 2017 or 2016.

U.S. Non-Agency Residential Mortgage-Backed Securities

We assess OTTI of our portfolio of U.S. non-agency residential mortgage-backed securities using cash flow models, tailored for each security, that estimate the future cash flows from the underlying mortgages, using the security-specific collateral and transaction structure. Estimates of future cash flows are subject to management judgment. The future cash flows and performance of our portfolio of U.S. non-agency residential mortgage-backed securities are a function of a number of factors, including, but not limited to, the condition of the U.S. economy, the condition of the U.S. residential mortgage markets, and the level of loan defaults, prepayments and loss severities. Management's estimates of future losses for each security also consider the underwriting and historical performance of each specific security, the underlying collateral type, vintage, borrower profile, third-party guarantees, current levels of subordination, geography and other factors. We recorded no OTTI on these securities in 2018, 2017 or 2016.

U.S. Non-Agency Commercial Mortgage-Backed Securities

With respect to our portfolio of U.S. non-agency commercial mortgage-backed securities, OTTI is assessed by considering a number of factors, including, but not limited to, the condition of the U.S. economy and the condition of the U.S. commercial real estate market, as well as capitalization rates. Management estimates of future losses for each security also consider the underlying collateral type, property location, vintage, debt-service coverage ratios, expected property income, servicer advances and estimated property values, as well as current levels of subordination. We recorded no OTTI on these securities in 2018 and 2017. In 2016 we recorded \$1 million of OTTI on these securities, all associated with expected credit losses.

The estimates, assumptions and other risk factors utilized in our assessment of impairment as described above are used by management to identify securities which are subject to further analysis of potential credit losses. Additional analyses are performed using more stressful assumptions to further evaluate the sensitivity of losses relative to the above-described factors. However, since the assumptions are based on the unique characteristics of each security, management uses a range of estimates for prepayment speeds, default, and loss severity forecasts that reflect the collateral profile of the securities within each asset class. In addition, in measuring expected credit losses, the individual characteristics of each security are examined to determine whether any additional factors would increase or mitigate the expected loss. Once losses are determined, the timing of the loss will also affect the ultimate OTTI, since the loss is ultimately subject to a discount commensurate with the purchase yield of the security.

After a review of the investment portfolio, taking into consideration current economic conditions, adverse situations that might affect our ability to fully collect principal and interest, the timing of future payments, the credit quality and performance of the collateral underlying MBS and ABS and other relevant factors, management considers the aggregate decline in fair value of the investment securities portfolio and the resulting gross pre-tax unrealized losses of \$1,056 million related to 1,129 securities as of December 31, 2018 to be temporary, and not the result of any material changes in the credit characteristics of the securities.

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Note 4. Loans and Leases

Loans are generally recorded at their principal amount outstanding, net of the allowance for loan losses, unearned income, and any net unamortized deferred loan origination fees. Acquired loans have been initially recorded at fair value based on management's expectation with respect to future principal and interest collection as of the date of acquisition. Acquired loans are held for investment, and as such their initial fair value is not adjusted subsequent to acquisition. Loans that are classified as held-for-sale are measured at lower of cost or fair value on an individual basis. Interest income related to loans is recognized in our consolidated statement of income using the interest method, or on a basis approximating a level rate of return over the term of the loan. Fees received for providing loan commitments and letters of credit that we anticipate will result in loans typically are deferred and amortized to interest income over the term of the related loan, beginning with the initial borrowing. Fees on commitments and letters of credit are amortized to processing fees and other revenue over the commitment period when funding is not known or expected. As of December 31, 2018, we had no net investment in leveraged lease financing compared to \$479 million as of December 31, 2017.

The following table presents our recorded investment in loans and leases, by segment, as of the dates indicated:

(In millions)	December 31, 2018	December 31, 2017
Domestic:		
Commercial and financial:		
Loans to investment funds	\$ 15,050	\$ 13,618
Senior secured bank loans	3,490	2,923
Loans to municipalities	902	2,105
Other	37	50
Commercial real estate	874	98
Lease financing ⁽¹⁾	—	267
Total domestic	20,353	19,061
Non-U.S.:		
Commercial and financial:		
Loans to investment funds	4,505	3,213
Senior secured bank loans	931	624
Lease financing ⁽¹⁾	—	396
Total non-U.S.	5,436	4,233
Total loans and leases	25,789	23,294
Allowance for loan and lease losses	(67)	(54)
Loans and leases, net of allowance	\$ 25,722	\$ 23,240

⁽¹⁾ Our leveraged lease portfolio was entirely sold off as of December 31, 2018.

We segregate our loans and leases into three segments: commercial and financial loans, commercial real estate loans and lease financing. We further classify commercial and financial loans as loans to investment funds, senior secured bank loans, loans to municipalities, and other. These classifications reflect their risk characteristics, their initial measurement attributes and the methods we use to monitor and assess credit risk.

The commercial and financial segment is composed of primarily floating-rate loans to mutual fund clients, purchased senior secured bank loans, and loans to municipalities. Investment fund lending is composed of short-duration revolving credit lines providing liquidity to fund clients in support of their transaction flows associated with securities' settlement activities.

Certain loans are pledged as collateral for access to the Federal Reserve's discount window. As of December 31, 2018 and December 31, 2017, the loans pledged as collateral totaled \$6.5 billion and \$1.9 billion, respectively.

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The following tables present our recorded investment in each class of loans and leases by credit quality indicator as of the dates indicated:

December 31, 2018 (In millions)	Commercial and Financial	Commercial Real Estate	Lease Financing	Total Loans and Leases
Investment grade ⁽¹⁾	\$ 19,599	\$ 874	\$ —	—\$ 20,473
Speculative ⁽²⁾	5,308	—	—	5,308
Substandard ⁽³⁾	8	—	—	8
Total	\$ 24,915	\$ 874	\$ —	—\$ 25,789
December 31, 2017 (In millions)	Commercial and Financial	Commercial Real Estate	Lease Financing	Total Loans and Leases
Investment grade ⁽¹⁾	\$ 17,866	\$ 98	\$ 663	\$ 18,627
Speculative ⁽²⁾	4,638	—	—	4,638
Special mention ⁽⁴⁾	29	—	—	29
Total	\$ 22,533	\$ 98	\$ 663	\$ 23,294

(1) Investment grade loans and leases consist of counterparties with strong credit quality and low expected credit risk and probability of default. Ratings apply to counterparties with a strong capacity to support the timely repayment of any financial commitment.

(2) Speculative loans consist of counterparties that face ongoing uncertainties or exposure to business, financial, or economic downturns. However, these counterparties may have financial flexibility or access to financial alternatives, which allow for financial commitments to be met.

(3) Substandard loans and leases consist of counterparties with well-defined weaknesses that jeopardize repayment with the possibility we will sustain some loss.

(4) Special mention loans consist of counterparties with potential weaknesses that, if uncorrected, may result in deterioration of repayment prospects.

We use an internal risk-rating system to assess our risk of credit loss for each loan or lease. This risk-rating process incorporates the use of risk-rating tools in conjunction with management judgment. Qualitative and quantitative inputs are captured in a systematic manner, and following a formal review and approval process, an internal credit rating based on our credit scale is assigned.

In assessing the risk rating assigned to each individual loan or lease, among the factors considered are the borrower's debt capacity, collateral coverage, payment history and delinquency experience, financial flexibility and earnings strength, the expected amounts and source of repayment, the level and nature of contingencies, if any, and the industry and geography

in which the borrower operates. These factors are based on an evaluation of historical and current information, and involve subjective assessment and interpretation. Credit counterparties are evaluated and risk-rated on an individual basis at least annually. Management considers the ratings to be current as of December 31, 2018.

We review all loans individually for indicators of impairment. Loans where such indicators exist are evaluated individually for impairment at least quarterly. For those loans where no such indicators are identified, the loans are collectively evaluated for impairment.

The following table presents our recorded investment in loans and leases, disaggregated based on our impairment methodology, as of the dates indicated:

(In millions)	December 31, 2018	December 31, 2017
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	Commercial and Financial	Commercial Real Estate	Lease Financing	Total Loans and Leases	Commercial and Financial	Commercial Real Estate	Lease Financing	Total Loans and Leases
Loans and leases:								
Individually evaluated for impairment ⁽¹⁾	\$8	\$ —	\$ —	\$8	\$—	\$ —	\$ —	\$—
Collectively evaluated for impairment	24,907	874	—	25,781	22,533	98	663	23,294
Total	\$24,915	\$ 874	\$ —	\$25,789	\$22,533	\$ 98	\$ 663	\$23,294

⁽¹⁾ As of December 31, 2018, we had one loan for \$8 million in the commercial and financial segment that was individually evaluated for impairment and deemed to be impaired. This loan was subsequently paid in full in January 2019. As of December 31, 2017, there were no impaired loans.

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In certain circumstances, we restructure troubled loans by granting concessions to borrowers experiencing financial difficulty. Once restructured, the loans are generally considered impaired until their maturity, regardless of whether the borrowers perform under the modified terms of the loans. There were no loans modified in troubled debt restructurings during the years ended December 31, 2018 and 2017.

We generally place loans on non-accrual status once principal or interest payments are 90 days contractually past due, or earlier if management determines that full collection is not probable. Loans 90 days past due, but considered both well-secured and in the process of collection, may be excluded from non-accrual status. When we place a loan on non-accrual status, the accrual of interest is discontinued and previously recorded but unpaid interest is reversed and generally charged against interest income. For loans on non-accrual status, income is recognized on a cash basis after recovery of principal, if and when interest payments are received. Loans may be removed from non-accrual status when repayment is reasonably assured and performance under the terms of the loan has been demonstrated. As of December 31, 2018 and December 31, 2017, we had no loans or leases on non-accrual status and no loans or leases contractually past due.

Allowance For Loan And Lease Losses

The allowance for loan and lease losses, recorded as a reduction of loans and leases in our consolidated statement of condition, represents management's estimate of incurred credit losses in our loan and lease portfolio as of the balance sheet date. The allowance is evaluated on a regular basis by management. Factors considered in evaluating the appropriate level of the allowance for each segment of our loan-and-lease portfolio include loss experience, the probability of default reflected in our internal risk rating of the counterparty's creditworthiness, current economic conditions and adverse situations that may affect the borrower's ability to repay, the estimated value of the underlying collateral, if any, the performance of individual credits in relation to contract terms, and other relevant factors. Loans and leases are charged off to the allowance for loan and lease losses in the reporting period in which either an event occurs that confirms the existence of a loss on a loan or lease, including a sale of a loan below its carrying value, or a portion of a loan or lease is determined to be uncollectible. In addition, any impaired loan or lease that is determined to be collateral-dependent is reduced to an amount equal to the fair value of the collateral less costs to sell. A loan or lease is identified as collateral-dependent when management determines that it is probable that the underlying collateral will be the sole source of repayment.

Recoveries are recorded on a cash basis as adjustments to the allowance.

The following table presents activity in the allowance for loan and lease losses for the periods indicated:

(In millions)	Years Ended		
	December 31,		
	2018	2017	2016
Allowance for loan and lease losses:			
Beginning balance	\$54	\$53	\$46
Provision for loan and lease losses ⁽¹⁾	15	2	10
Charge-offs ⁽¹⁾	(2)	(1)	(3)
Ending balance	\$67	\$54	\$53

⁽¹⁾ The provisions and charge-offs for loans and leases were primarily attributable to exposure to senior secured loans to non-investment grade borrowers, purchased in connection with our loans.

Loans and leases are reviewed on a regular basis, and any provisions for loan and lease losses that are recorded reflect management's estimate of the amount necessary to maintain the allowance for loan and lease losses at a level considered appropriate to absorb estimated incurred losses in the loan and lease portfolio.

Off-Balance Sheet Credit Exposures

The reserve for off-balance sheet credit exposures, recorded in accrued expenses and other liabilities in our consolidated statement of condition, represents management's estimate of probable credit losses primarily in

outstanding letters and lines of credit and other credit-enhancement facilities provided to our clients and outstanding as of the balance sheet date.

The reserve is evaluated on a regular basis by management. Factors considered in evaluating the appropriate level of this reserve are similar to those considered with respect to the allowance for loan and lease losses. Provisions to maintain the reserve at a level considered by us to be appropriate to absorb estimated incurred credit losses in outstanding facilities are recorded in other expenses in our consolidated statement of income.

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Note 5. Goodwill and Other Intangible Assets

Goodwill represents the excess of the cost of an acquisition over the fair value of the net tangible and other intangible assets acquired. Other intangible assets represent purchased long-lived intangible assets, primarily client relationships, that can be distinguished from goodwill because of contractual rights or because the asset can be exchanged on its own or in combination with a related contract, asset or liability. Goodwill is not amortized, but is subject to at least annual evaluation for impairment. Other intangible assets, which are also subject to annual evaluation for impairment, are mainly related to client relationships, which are amortized on a straight-line basis over periods ranging from five to twenty years, technology assets, which are amortized on a straight-line basis over periods ranging from three to ten years, and core deposit intangible assets, which are amortized on a straight-line basis over periods

ranging from sixteen to twenty-two years, with such amortization recorded in other expenses in our consolidated statement of income.

Impairment of goodwill is deemed to exist if the carrying value of a reporting unit, including its allocation of goodwill and other intangible assets, exceeds its estimated fair value. Impairment of other intangible assets is deemed to exist if the balance of the other intangible asset exceeds the cumulative expected net cash inflows related to the asset over its remaining estimated useful life. If these reviews determine that goodwill or other intangible assets are impaired, the value of the goodwill or the other intangible asset is written down through a charge to other expenses in our consolidated statement of income. There were no impairments to goodwill or other intangible assets in 2018.

The following table presents changes in the carrying amount of goodwill during the periods indicated:

(In millions)	Investment Servicing ⁽¹⁾	Investment Management	Total
Goodwill:			
Ending balance December 31, 2016	\$ 5,550	\$ 264	\$5,814
Acquisitions	17	—	17
Divestitures and other reductions	(9)	—	(9)
Foreign currency translation	194	6	200
Ending balance December 31, 2017	5,752	270	6,022
Acquisitions ⁽¹⁾	1,512	—	1,512
Foreign currency translation	(84)	(4)	(88)
Ending balance December 31, 2018	\$ 7,180	\$ 266	\$7,446

⁽¹⁾ Investment Servicing includes our acquisition of Charles River Development on October 1, 2018, which is described in Note 1.

The following table presents changes in the net carrying amount of other intangible assets during the periods indicated:

(In millions)	Investment Servicing ⁽¹⁾	Investment Management	Total
Other intangible assets:			
Ending balance December 31, 2016	\$ 1,539	\$ 211	\$1,750
Acquisitions	16	—	16
Divestitures	(11)	—	(11)
Amortization	(183)	(31)	(214)
Foreign currency translation	71	1	72
Ending balance December 31, 2017	1,432	181	1,613
Acquisitions ⁽¹⁾	1,007	—	1,007
Amortization	(196)	(30)	(226)
Foreign currency translation	(25)	—	(25)

Ending balance December 31, 2018 \$ 2,218 \$ 151 \$2,369

⁽¹⁾ Investment Servicing includes our acquisition of Charles River Development on October 1, 2018, which is described in Note 1.

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The following table presents the gross carrying amount, accumulated amortization and net carrying amount of other intangible assets by type as of the dates indicated:

(In millions)	December 31, 2018			December 31, 2017		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Other intangible assets:						
Client relationships	\$3,262	\$ (1,605)	\$ 1,657	\$2,669	\$ (1,470)	\$ 1,199
Technology	389	(49)	340	47	(40)	7
Core deposits	676	(350)	326	686	(320)	366
Other	103	(57)	46	95	(54)	41
Total	\$4,430	\$ (2,061)	\$ 2,369	\$3,497	\$ (1,884)	\$ 1,613

Amortization expense related to other intangible assets was \$226 million, \$214 million and \$207 million in 2018, 2017 and 2016, respectively.

Expected future amortization expense for other intangible assets recorded as of December 31, 2018 is as follows:

(In millions)	Future Amortization
Years Ended December 31,	
2019	\$ 245
2020	243
2021	236
2022	233
2023	232

Note 6. Other Assets

The following table presents the components of other assets as of the dates indicated:

(In millions)	December 31,	
	2018	2017
Securities borrowed ⁽¹⁾	\$19,575	\$19,404
Derivative instruments, net	5,189	4,013
Bank-owned life insurance	3,323	3,242
Investments in joint ventures and other unconsolidated entities ⁽²⁾	2,912	2,259
Collateral, net	1,354	473
Receivable for securities settlement	531	188
Prepaid expenses	493	364
Accounts receivable	343	348
Income taxes receivable	129	97
Deferred tax assets, net of valuation allowance ⁽³⁾	113	113
Deposits with clearing organizations	58	120
Other	414	397
Total	\$34,434	\$31,018

⁽¹⁾ Refer to Note 11, for further information on the impact of collateral on our financial statement presentation of securities borrowing and securities lending transactions.

⁽²⁾ Includes certain equity securities held at fair value through profit and loss that were transferred from AFS as part of our adoption of ASU 2016-01. Refer to Note 1, for further information on this new accounting standard.

⁽³⁾ Deferred tax assets and liabilities recorded in our consolidated statement of condition are netted within the same tax jurisdiction.

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Note 7. Deposits

As of December 31, 2018, we had \$46.40 billion of time deposits outstanding, of which \$4.52 billion were wholesale CDs, \$41.57 billion were derived from client deposits (payable on demand to such clients) and held in a time deposit established by us as the agent and \$314 million were non-U.S. and all of which are scheduled to mature in 2019. As of December 31, 2017, we had \$39.73 billion of time deposits outstanding, of which \$4.75 billion were wholesale CDs, \$34.73 billion were derived from client deposits (payable on demand to such clients) and held in a time deposit established by us as the agent and \$252 million were non-U.S. As of December 31, 2018 and 2017, all U.S. and non-U.S. time deposits were in amounts of \$100,000 or more. Demand deposit overdrafts of \$5.44 billion and \$3.24 billion were included as loan balances at December 31, 2018 and 2017, respectively.

Note 8. Short-Term Borrowings

Our short-term borrowings include securities sold under repurchase agreements, short-term borrowings associated with our tax-exempt investment program (more fully described in Note 14), and other short-term borrowings. Collectively, short-term borrowings had weighted-average interest rates of 0.88% and 0.25% in 2018 and 2017, respectively.

The following table presents information with respect to the amounts outstanding and weighted-average interest rates of the primary components of our short-term borrowings as of and for the years ended December 31:

	2018	2017	2016	2018	2017	2016	2018	2017	2016
(Dollars in millions)	Securities Sold Under Repurchase Agreements			Tax-Exempt Investment Program			Other		
Balance as of December 31	\$1,082	\$2,842	\$4,400	\$931	\$1,078	\$1,158	\$2,000	\$—	\$—
Maximum outstanding as of any month-end	3,441	4,302	5,572	1,078	1,158	1,726	2,000	—	29
Average outstanding during the year	2,048	3,683	4,113	1,023	1,127	1,512	nm	1	31
Weighted-average interest rate as of year-end	1.38	% .03	% .04	% 1.74	% 1.45	% .67	% 2.68	% .00	% .00
Weighted-average interest rate during the year	.62	.05	.02	1.46	.79	.36	nm	.00	.17

nm Not meaningful

Obligations to repurchase securities sold are recorded as a liability in our consolidated statement of condition. U.S. government securities with a fair value of \$1.10 billion underlying the repurchase agreements remained in our investment securities portfolio as of December 31, 2018.

The following table presents information about these U.S. government securities and the carrying value of the related repurchase agreements, including accrued interest, as of December 31, 2018.

(In millions)	U.S. Government Securities Sold Amortized Cost	Fair Value	Repurchase Agreements ⁽¹⁾ Amortized Cost
Overnight maturity	\$ 1,127	\$ 1,100	\$ 1,082

⁽¹⁾ Collateralized by investment securities.

We maintain an agreement with a clearing organization that enables us to net all securities purchased under resale agreements and sold under repurchase agreements with counterparties that are also members of the clearing organization. As a result of this netting, the average balances of securities purchased under resale agreements and

securities sold under repurchase agreements were reduced by \$35.74 billion in 2018 compared to \$31.15 billion in 2017.

State Street Bank currently maintains a line of credit of CAD 1.40 billion, or approximately \$1.03 billion, as of December 31, 2018, to support its Canadian securities processing operations. The line of credit has no stated termination date and is cancelable by either party with prior notice. As of December 31, 2018 and 2017, there was no balance outstanding on this line of credit.

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Note 9. Long-Term Debt

(Dollars in
millions)

Issuance Date	Maturity Date	Coupon Rate	Seniority	Interest Due Dates	As of December 31,	
					2018	2017
Parent Company And Non-Banking Subsidiary Issuances						
August 18, 2015	August 18, 2025	3.55	% Senior notes	2/18; 8/18 ⁽¹⁾	\$ 1,268	\$ 1,287
August 18, 2015	August 18, 2020	2.55	% Senior notes	2/18; 8/18	1,177	1,184
November 19, 2013	November 20, 2023	3.7	% Senior notes	5/20; 11/20 ⁽¹⁾	1,006	1,021
December 15, 2014	December 16, 2024	3.3	% Senior notes	6/16; 12/16 ⁽¹⁾	979	993
May 15, 2013	May 15, 2023 ⁽²⁾	3.1	% Subordinated notes	5/15; 11/15 ⁽¹⁾	972	981
April 30, 2007	June 15, 2047	Floating-rate	Junior subordinated debentures	3/15; 6/15; 9/15; 12/15	794	793
May 15, 2017	May 15, 2023	2.653	% Fixed-to-floating rate senior notes	5/15; 11/15 ⁽¹⁾	734	740
March 7, 2011	March 7, 2021	4.375	% Senior notes	3/7; 9/7 ⁽¹⁾	731	734
May 19, 2016	May 19, 2021	1.95	% Senior notes	5/19; 11/19 ⁽¹⁾	725	724
May 19, 2016	May 19, 2026	2.65	% Senior notes	5/19; 11/19 ⁽¹⁾	698	706
December 3, 2018	December 3, 2029	4.141	% Fixed-to-floating rate senior notes	6/3; 12/3 ⁽¹⁾	513	—
December 3, 2018	December 3, 2024	3.776	% Fixed-to-floating rate senior notes	6/3; 12/3 ⁽¹⁾	507	—
August 18, 2015	August 18, 2020	Floating-rate	Senior notes	2/18; 5/18; 8/18; 11/18	499	499
May 15, 1998	May 15, 2028	Floating-rate	Junior subordinated debentures	2/15; 5/15; 8/15; 11/15	150	150
June 21, 1996	June 15, 2026 ⁽³⁾	7.35	% Senior notes	6/15; 12/15	150	150
February 11, 2011	March 15, 2018	4.956	% Junior subordinated debentures	3/15; 9/15	—	502
May 15, 2013	May 15, 2018	1.35	% Senior notes	5/15; 11/15	—	499
Parent Company						
Long-term capital leases					190	250
State Street Bank issuances						
September 24, 2003	October 15, 2018 ⁽²⁾	5.25	% Subordinated notes	4/15; 10/15	—	407
Total long-term debt					\$ 11,093	\$ 11,620

We have entered into interest rate swap agreements, recorded as fair value hedges, to modify our interest expense on these senior and subordinated notes from a fixed rate to a floating rate. As of December 31, 2018 and 2017, the carrying value of long-term debt associated with these fair value hedges decreased \$157 million and \$87 million, respectively. Refer to Note 10 for additional information about fair value hedges.

(2)

The subordinated notes qualify for inclusion in tier 2 regulatory capital under current federal regulatory capital guidelines.

(3) We may not redeem notes prior to their maturity.

Parent Company

As of December 31, 2018 and 2017, long-term capital leases included \$190 million and \$244 million, respectively, related to our One Lincoln Street headquarters building and related underground parking garage. Refer to Note 20 for additional information.

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Note 10. Derivative Financial Instruments

We use derivative financial instruments to support our clients' needs and to manage our interest rate and currency risks. These financial instruments consist of foreign exchange contracts such as forwards, futures and options contracts; interest rate contracts such as interest rate swaps (cross currency and single currency) and futures; and other derivative contracts. Derivatives instruments used for risk management purposes that are highly effective in offsetting the risk being hedged are generally designated as hedging instruments in hedge accounting relationships while others are economic hedges and not designated in hedge accounting relationships. Derivatives in hedge accounting relationships are disclosed according to the type of hedge, such as, fair value, cash flow, or net investment.

Derivatives designated as hedging instruments in hedge accounting relationships are carried at fair value with change in fair value recognized in the consolidated statement of income or OCI, as appropriate. Derivatives not designated in hedge accounting relationships include those derivatives entered into to support client needs and derivatives used to manage interest rate or foreign currency risk associated with certain assets and liabilities. Such derivatives are carried at fair value with changes in fair value recognized in the consolidated statement of income.

Derivatives Not Designated as Hedging Instruments

We provide foreign exchange forward contracts and options in support of our client needs, and also act as a dealer in the currency markets. As part of our trading activities, we assume positions in both the foreign exchange and interest rate markets by buying and selling cash instruments and using derivative financial instruments, including foreign exchange forward contracts, foreign exchange and interest rate options, interest rate forward contracts, and interest rate futures. The entire change in the fair value of our non-hedging derivatives utilized in our trading activities are recorded in foreign exchange trading services revenue, and the entire change in fair value of our non-hedging derivatives utilized in our asset-and-liability management activities are recorded in net interest income.

We enter into stable value wrap derivative contracts with unaffiliated stable value funds that allow a stable value fund to provide book value coverage to its participants. These derivatives contracts qualify as guarantees as described in Note 12.

We grant deferred cash awards to certain of our employees as part of our employee incentive compensation plans. We account for these awards as derivative financial instruments, as the underlying referenced shares are not equity instruments of ours.

The fair value of these derivatives is referenced to the value of units in State Street-sponsored investment funds or funds sponsored by other unrelated entities. We re-measure these derivatives to fair value quarterly, and record the change in value in compensation and employee benefits expenses in our consolidated statement of income.

Derivatives Designated as Hedging Instruments

We adopted ASU 2017-12, in the fourth quarter of 2018, which better aligns hedge accounting with the economics of our risk management activities. Additional information on this new standard is provided in Note 1.

In connection with our asset-and-liability management activities, we use derivative financial instruments to manage our interest rate risk and foreign currency risk for certain assets and liabilities. At both the inception of the hedge and on an ongoing basis, we formally assess and document the effectiveness of a derivative designated in a hedging relationship and the likelihood that the derivative will be an effective hedge in future periods. We discontinue hedge accounting prospectively when we determine that the derivative is no longer highly effective in offsetting changes in fair value or cash flows of the underlying risk being hedged, the derivative expires, terminates or is sold, or management discontinues the hedge designation.

The risk management objective of a highly effective hedging strategy that qualifies for hedge accounting must be formally documented. The hedge documentation includes the derivative hedging instrument, the asset or liability or forecasted transaction, type of risk being hedged and method for assessing hedge effectiveness of the derivative prospectively and retrospectively. We use quantitative methods including regression analysis and cumulative dollar offset method, comparing the change in the fair value of the derivative to the change in fair value or the cash flows of the hedged item. We may also utilize qualitative methods such as matching critical terms and evaluation of any

changes in those critical terms. Effectiveness is assessed and documented quarterly and if determined that the derivative is not highly effective at hedging the designated risk hedge accounting is discontinued.

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Fair Value Hedges

Derivatives designated as fair value hedges are utilized to mitigate the risk of changes in the fair values of recognized assets and liabilities, including long-term debt, AFS securities, and foreign currency investment securities. We use interest rate or foreign exchange contracts in this manner to manage our exposure to changes in the fair value of hedged items caused by changes in interest rates or foreign exchange rates.

Changes in the fair value of the derivative and changes in fair value of the hedged item due to changes in the hedged risk are recognized in earnings in the same line item. As of January 1, 2018, we prospectively changed the presentation of both hedging instruments and hedged items designated as fair value hedges of interest rate risk from processing fees and other revenue to net interest income. If a hedge is terminated, all remaining adjustments to the carrying amount of the hedged item shall be amortized over a period that is consistent with the amortization of other discounts or premiums associated with the hedged item.

Cash Flow Hedges

Derivatives designated as cash flow hedges are utilized to offset the variability of cash flows of recognized assets or liabilities or forecasted transactions. We have entered into foreign exchange contracts to hedge the change in cash flows attributable to foreign exchange movements in foreign currency denominated investment securities.

Additionally, we have entered into interest rate swap agreements to hedge the forecasted cash flows associated with LIBOR-indexed floating-rate loans. The interest rate swaps synthetically convert the loan interest receipts from a variable-rate to a fixed-rate, thereby mitigating the risk attributable to changes in the LIBOR benchmark rate.

Changes in fair value of the derivatives designated as cash flow hedges are initially recorded in AOCI and then reclassified into earnings in the same period or periods during which the hedged forecasted transaction affects earnings and are presented in the same income statement line item as the earnings effect of the hedged item. If the hedge relationship is terminated, the change in fair value on the derivative recorded in AOCI is reclassified into earnings consistent with the timing of the hedged item. For hedge relationships that are discontinued because a forecasted transaction is not expected to occur according to the original hedge terms, any related derivative values recorded in AOCI are immediately recognized in earnings. As of December 31, 2018, the maximum maturity date of the underlying loans is approximately 4.9 years.

Net Investment Hedges

Derivatives categorized as net investment hedges are entered into to protect the net investment in our foreign operations against adverse changes in exchange rates. We use foreign exchange forward contracts to convert the foreign currency risk to U.S. dollars to mitigate our exposure to fluctuations in foreign exchange rates. The changes in fair value of the foreign exchange forward contracts are recorded, net of taxes, in the foreign currency translation component of OCI.

The following table presents the aggregate contractual, or notional, amounts of derivative financial instruments entered into in connection with our trading and asset-and-liability management activities as of the dates indicated:

(In millions)	December 31,	
	2018	2017
Derivatives not designated as hedging instruments:		
Interest rate contracts:		
Futures	\$2,348	\$ 2,392
Foreign exchange contracts:		
Forward, swap and spot	2,238,810	1,679,976
Options purchased	578	350
Options written	576	302
Futures	49	50
Commodity and equity contracts:		

Commodity ⁽¹⁾	—	16
Equity ⁽¹⁾	—	50
Other:		
Stable value contracts ⁽²⁾	26,634	26,653
Deferred value awards ⁽³⁾	434	473
Derivatives designated as hedging instruments:		
Interest rate contracts:		
Swap agreements	10,596	11,047
Foreign exchange contracts:		
Forward and swap	3,412	28,913

⁽¹⁾ Primarily composed of positions held by a consolidated sponsored investment fund.

⁽²⁾ The notional value of the stable value contracts generally represents our maximum exposure. However, exposure to various stable value contracts is contractually limited to substantially lower amounts than the notional values, which represent the total assets of the stable value funds.

⁽³⁾ Represents grants of deferred value awards to employees; refer to discussion in this note under "Derivatives Not Designated as Hedging Instruments."

Notional amounts are provided here as an indication of the volume of our derivative activity and serve as a reference to calculate the fair values of the derivative.

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The following tables present the fair value of derivative financial instruments, excluding the impact of master netting agreements, recorded in our consolidated statement of condition as of the dates indicated. The impact of master netting agreements is provided in Note 11.

(In millions)	December 31,		December 31,	
	2018	2017	2018	2017
	Derivative Assets ⁽¹⁾		Derivative Liabilities ⁽²⁾	
	Fair Value		Fair Value	
Derivatives not designated as hedging instruments:				
Foreign exchange contracts	\$16,369	\$11,477	\$16,434	\$11,361
Other derivative contracts	—	1	214	284
Total	\$16,369	\$11,478	\$16,648	\$11,645

Derivatives designated as hedging instruments:

Foreign exchange contracts	\$17	\$120	\$88	\$107
Interest rate contracts	13	8	71	100
Total	\$30	\$128	\$159	\$207

⁽¹⁾ Derivative assets are included within other assets in our consolidated statement of condition.

⁽²⁾ Derivative liabilities are included within other liabilities in our consolidated statement of condition.

The following tables present the impact of our use of derivative financial instruments on our consolidated statement of income for the periods indicated:

(In millions)	Location of Gain (Loss) on Derivative in Consolidated Statement of Income	Years Ended		
		December 31,		
		2018	2017	2016
		Amount of Gain (Loss) on Derivative Recognized in Consolidated Statement of Income		
Derivatives not designated as hedging instruments:				
Foreign exchange contracts	Foreign exchange trading services revenue	\$723	\$632	\$662
Foreign exchange contracts	Interest expense ⁽¹⁾	(41)	—	—
Foreign exchange contracts	Processing fees and other revenue	—	(23)	—
Interest rate contracts	Foreign exchange trading services revenue	(6)	8	(7)
Interest rate contracts	Processing fees and other revenue ⁽¹⁾	(1)	—	1
Credit derivative contracts	Foreign exchange trading services revenue	—	—	(1)
Other derivative contracts	Foreign exchange trading services revenue	5	—	(2)
Other derivative contracts	Compensation and employee benefits	(171)	(143)	(448)
Total		\$509	\$474	\$205

⁽¹⁾ 2018 includes approximately \$15 million of swap costs related to the first quarter of 2018 that were reclassified from Processing fees and other revenues to NII.

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The following table shows the carrying amount and associated cumulative basis adjustments related to the application of hedge accounting that is included in the carrying amount of hedged assets and liabilities in fair value hedging relationships:

December 31, 2018	Hedged Items		Hedged Items No	
	Currently Designated	Longer Designated ⁽¹⁾	Currently Designated	Longer Designated ⁽¹⁾
(In millions)	Carrying Amount	Cumulative Hedge	Carrying Amount	Cumulative Hedge
	of Assets (Liabilities)	Accounting Basis Adjustments	of Assets (Liabilities)	Accounting Basis Adjustments
Long-term debt	\$8,270	\$ (137)	\$1,197	\$ (20)
Available-for-sale securities	1,496	72	50	1
Total	\$9,766	\$ (65)	\$1,247	\$ (19)

December 31, 2017	Hedged Items		Hedged Items No	
	Currently Designated	Longer Designated ⁽¹⁾	Currently Designated	Longer Designated ⁽¹⁾
(In millions)	Carrying Amount	Cumulative Hedge	Carrying Amount	Cumulative Hedge
	of Assets (Liabilities)	Accounting Basis Adjustments	of Assets (Liabilities)	Accounting Basis Adjustments
Long-term debt	\$8,465	\$ (95)	\$1,400	\$ 8
Available-for-sale securities	1,926	106	894	1
Total	\$10,391	\$ 11	\$2,294	\$ 9

⁽¹⁾ Represents hedged items no longer designated in qualifying fair value hedging relationships for which an associated basis adjustment exists at the balance sheet date.

⁽²⁾ Does not include the carrying amount of hedged items when only foreign currency risk is the designated hedged risk. The carrying amount excluded for investment securities was \$458 million and \$763 million for December 31, 2018 and 2017, respectively. The carrying amount of assets (liabilities) excludes deposits of zero and \$13.2 billion for December 31, 2018 and 2017, respectively.

As of December 31, 2018 and 2017, the total notional amount of the interest rate swaps of fair value hedges was \$9.3 billion and \$9.7 billion, respectively.

The following tables present the impact of our use of derivative financial instruments on our consolidated statement of income for the periods indicated:

(In millions)	Location of Gain (Loss) on Derivative in Consolidated Statement of Income	Years Ended December 31,			Hedged Item in Fair Value Hedging Relationship	Location of Gain (Loss) on Hedged Item in Consolidated Statement of Income	Years Ended December 31,		
		2018	2017	2016			2018	2017	2016
	Amount of Gain (Loss) on Derivative Recognized in Consolidated Statement of Income					Amount of Gain (Loss) on Hedged Item Recognized in Consolidated Statement of Income			

Derivatives designated as fair value hedges:

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Foreign exchange contracts	Processing fees and other revenue	\$(74)	\$18	\$(6)	Investment securities	Processing fees and other revenue	\$74	\$(18)	\$6
Foreign exchange contracts	Processing fees and other revenue	(328)	626	221	FX deposit	Processing fees and other revenue	328	(626)	(221)
Interest rate contracts ⁽¹⁾	Net interest income	31	—	—	Available-for-sale securities ⁽²⁾	Net interest income	(32)	—	—
Interest rate contracts ⁽¹⁾	Net interest income	(58)	—	—	Long-term debt	Net interest income	49	—	—
Interest rate contracts ⁽¹⁾	Processing fees and other revenue	—	39	43	Available-for-sale securities ⁽²⁾	Processing fees and other revenue	—	(37)	(40)
Interest rate contracts ⁽¹⁾	Processing fees and other revenue	—	(38)	(98)	Long-term debt	Processing fees and other revenue	—	39	100
Total		\$(429)	\$645	\$160			\$419	\$(642)	\$(155)

⁽¹⁾ As of January 1, 2018, we prospectively changed the presentation of gains (losses) on hedging instruments and hedge items designated as fair value hedges of interest rate risk, and any resulting hedge ineffectiveness, from processing fees and other revenue to NII.

⁽²⁾ In 2018, 2017 and 2016, \$24 million, \$22 million and \$23 million, respectively, of net unrealized gains on AFS investment securities designated in fair value hedges were recognized in OCI.

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(In millions)	Years Ended December 31, 2018 2017 2016			Location of Gain or (Loss) Reclassified from Accumulated Other Comprehensive Income into Income	Years Ended December 31, 2018 2017 2016		
	Amount of Gain or (Loss) Recognized in Other Comprehensive Income on Derivative				Amount of Gain or (Loss) Reclassified from Accumulated Other Comprehensive Income into Income		
Derivatives designated as cash flow hedges:							
Interest rate contracts	\$(12)	\$(14)	\$—	Net interest income	\$(1)	\$ 2	\$—
Foreign exchange contracts	(12)	(104)	(39)	Net interest income	27	24	24
Total	\$(24)	\$(118)	\$(39)		\$ 26	\$ 26	\$ 24
Derivatives designated as net investment hedges:							
Foreign exchange contracts	\$81	\$(160)	\$109	Gains (losses) related to investment securities, net	\$—	\$—	\$—
Total	\$81	\$(160)	\$109		\$—	\$—	\$—

Derivatives Netting and Credit Contingencies

Netting

Derivatives receivable and payable as well as cash collateral from the same counterparty are netted in the consolidated statement of condition for those counterparties with whom we have legally binding master netting agreements in place. In addition to cash collateral received and transferred presented on a net basis, we also receive and transfer collateral in the form of securities, which mitigate credit risk but are not eligible for netting. Additional information on netting is provided in Note 11.

Credit Contingencies

Certain of our derivatives are subject to master netting agreements with our derivative counterparties containing credit risk-related contingent features, which requires us to maintain an investment grade credit rating with the various credit rating agencies. If our rating falls below investment grade, we would be in violation of the provisions, and counterparties to the derivatives could request immediate payment or demand full overnight collateralization on derivatives instruments in net liability positions. The aggregate fair value of all derivatives with credit contingent features and in a liability position as of December 31, 2018 totaled approximately \$2.1 billion, against which we provided \$1.1 billion of collateral in the normal course of business. If our credit related contingent features underlying these agreements were triggered as of December 31, 2018, the maximum additional collateral we would be required to post to our counterparties is approximately \$1.0 billion.

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Note 11. Offsetting Arrangements

Certain of our transactions are subject to master netting agreements that allow us to net receivables and payables by contract and settlement type. For those legally enforceable contracts, we net receivables and payables with the same counterparty on our statement of condition.

In addition to netting receivables and payables with our derivatives counterparty where a legal and enforceable netting arrangement exist, we also net related cash collateral received and transferred up to the fair value exposure amount. With respect to our securities financing arrangements, we net balances outstanding on our consolidated statement of condition for those transactions that met the netting requirements and were transacted under a legally enforceable netting arrangement with the counterparty.

Securities received as collateral under securities financing or derivatives transactions can be transferred as collateral in many instances. The securities received

as proceeds under secured lending transactions are recorded at a value that approximates fair value in other assets in our consolidated statement of condition with a related liability to return the collateral, if we have the right to transfer or re-pledge the collateral.

As of December 31, 2018 and December 31, 2017, the value of securities received as collateral from third parties where we are permitted to transfer or re-pledge the securities totaled \$11.69 billion and \$2.47 billion, respectively, and the fair value of the portion that had been transferred or re-pledged as of the same dates was \$5.31 billion and \$15 million, respectively. The increase in 2018 is primarily attributable to underlying client assets related to our enhanced custody business, which assets clients have allowed us to transfer or re-pledge.

The following tables present information about the offsetting of assets related to derivative contracts and secured financing transactions, as of the dates indicated:

Assets:	December 31, 2018		Net	Gross Amounts Not	
(In millions)	Gross Amounts of Recognize Assets ⁽¹⁾⁽²⁾	Gross Amounts Offset in Statement of Condition ⁽³⁾	Amounts of Assets Presented in Statement of Condition	Offset in Statement of Condition	Cash and Securities Received ⁽⁴⁾ Net Amount ⁽⁵⁾
Derivatives:					
Foreign exchange contracts	\$ 16,386	\$ (10,223)	\$ 6,163	\$—	\$ 6,163
Interest rate contracts ⁽⁶⁾	13	—	13	—	13
Other derivative contracts	—	—	—	—	—
Cash collateral and securities netting	NA	(987)	(987)	(220)	(1,207)
Total derivatives	16,399	(11,210)	5,189	(220)	4,969
Other financial instruments:					
Resale agreements and securities borrowing ⁽⁷⁾	116,143	(91,889)	24,254	(22,872)	1,382
Total derivatives and other financial instruments	\$ 132,542	\$ (103,099)	\$ 29,443	\$ (23,092)	\$ 6,351
Assets:	December 31, 2017		Net	Gross Amounts Not	
(In millions)	Gross Amounts of Recognize Assets ⁽¹⁾⁽²⁾	Gross Amounts Offset in Statement of Condition ⁽³⁾	Amounts of Assets Presented in Statement	Offset in Statement of Condition	Cash and Securities Received ⁽⁴⁾ Net Amount ⁽⁵⁾

	of Condition				
Derivatives:					
Foreign exchange contracts	\$ 11,597	\$ (5,548	) \$ 6,049	\$—	\$ 6,049
Interest rate contracts ⁽⁶⁾	8	—	8	—	8
Other derivative contracts	1	—	1	—	1
Cash collateral and securities netting	NA	(2,045	) (2,045	) (124	) (2,169
Total derivatives	11,606	(7,593	) 4,013	(124	) 3,889
Other financial instruments:					
Resale agreements and securities borrowing ⁽⁷⁾	70,079	(47,434	) 22,645	(22,645) —
Total derivatives and other financial instruments	\$ 81,685	\$ (55,027	) \$ 26,658	\$(22,769)	\$ 3,889

(1) Amounts include all transactions regardless of whether or not they are subject to an enforceable netting arrangement.

(2) Refer to Note 1 and Note 2 for additional information about the measurement basis of derivative instruments.

(3) Amounts subject to netting arrangements which have been determined to be legally enforceable and eligible for netting in the consolidated statement of condition.

(4) Includes securities in connection with our securities borrowing transactions.

(5) Includes amounts secured by collateral not determined to be subject to enforceable netting arrangements.

(6) Variation margin payments presented as settlements rather than collateral.

(7) Included in the \$24.3 billion as of December 31, 2018 were \$4.7 billion of resale agreements and \$19.6 billion of collateral provided related to securities borrowing. Included in the \$22.6 billion as of December 31, 2017 were \$3.2 billion of resale agreements and \$19.4 billion of collateral provided related to securities borrowing. Resale agreements and collateral provided related to securities borrowing were recorded in securities purchased under resale agreements and other assets, respectively, in our consolidated statement of condition. Refer to Note 12 for additional information with respect to principal securities finance transactions.

NA Not applicable

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The following tables present information about the offsetting of liabilities related to derivative contracts and secured financing transactions, as of the dates indicated:

(In millions)	December 31, 2018		Net Amounts of Liabilities Presented in Statement of Condition	Gross Amounts Not Offset in Statement of Condition	
	Gross Amounts of Recognized Liabilities ⁽¹⁾	Gross Amounts Offset in Statement of Condition ⁽²⁾		Cash and Securities Received ⁽⁴⁾	Net Amount ⁽⁵⁾
Derivatives:					
Foreign exchange contracts	\$ 16,522	\$ (10,223)	\$ 6,299	\$—	\$ 6,299
Interest rate contracts ⁽⁶⁾	71	—	71	—	71
Other derivative contracts	214	—	214	—	214
Cash collateral and securities netting	NA	(1,341)	(1,341)	(215)	(1,556)
Total derivatives	16,807	(11,564)	5,243	(215)	5,028
Other financial instruments:					
Repurchase agreements and securities lending ⁽⁷⁾	104,494	(91,889)	12,605	(11,543)	1,062
Total derivatives and other financial instruments	\$ 121,301	\$ (103,453)	\$ 17,848	\$ (11,758)	\$ 6,090
Liabilities:					
(In millions)	December 31, 2017		Net Amounts of Liabilities Presented in Statement of Condition	Gross Amounts Not Offset in Statement of Condition	
	Gross Amounts of Recognized Liabilities ⁽¹⁾	Gross Amounts Offset in Statement of Condition ⁽²⁾		Cash and Securities Received ⁽⁴⁾	Net Amount ⁽⁵⁾
Derivatives:					
Foreign exchange contracts	\$ 11,467	\$ (5,548)	\$ 5,919	\$—	\$ 5,919
Interest rate contracts ⁽⁶⁾	100	—	100	—	100
Other derivative contracts	285	—	285	—	285
Cash collateral and securities netting	NA	(422)	(422)	(450)	(872)
Total derivatives	11,852	(5,970)	5,882	(450)	5,432
Other financial instruments:					
Repurchase agreements and securities lending ⁽⁷⁾	54,127	(47,434)	6,693	(4,299)	2,394
Total derivatives and other financial instruments	\$ 65,979	\$ (53,404)	\$ 12,575	\$ (4,749)	\$ 7,826

(1) Amounts include all transactions regardless of whether or not they are subject to an enforceable netting arrangement.

(2) Refer to Note 1 and Note 2 for additional information about the measurement basis of derivative instruments

(3) Amounts subject to netting arrangements which have been determined to be legally enforceable and eligible for netting in the consolidated statement of condition.

(4) Includes securities provided in connection with our securities lending transactions.

(5) Includes amounts secured by collateral not determined to be subject to enforceable netting arrangements.

(6) Variation margin payments presented as settlements rather than collateral.

(7) Included in the \$12.6 billion as of December 31, 2018 were \$1.1 billion of repurchase agreements and \$11.5 billion of collateral received related to securities lending transactions. Included in the \$6.7 billion as of December 31, 2017 were \$2.8 billion of repurchase agreements and \$3.9 billion of collateral received related to securities lending transactions. Repurchase agreements and collateral received related to securities lending were recorded in securities sold under repurchase agreements and accrued expenses and other liabilities, respectively, in our consolidated statement of condition. Refer to Note 12 for additional information with respect to principal securities finance transactions.

^{NA} Not applicable

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The securities transferred under resale and repurchase agreements typically are U.S. Treasury, agency and agency MBS. In our principal securities borrowing and lending arrangements, the securities transferred are predominantly equity securities and some corporate debt securities. The fair value of the securities transferred may increase in value to an amount greater than the amount received under our repurchase and securities lending arrangements, which exposes the Company to counterparty risk. We require the review of the price of the underlying securities in

relation to the carrying value of the repurchase agreements and securities lending arrangements on a daily basis and when appropriate, adjust the cash or security to be obtained or returned to counterparties that is reflective of the required collateral levels.

The following table summarizes our repurchase agreements and securities lending transactions by category of collateral pledged and remaining maturity of these agreements as of the periods indicated:

(In millions)	As of December 31, 2018			As of December 31, 2017 ⁽¹⁾
	Overnight and Continuous	Up to 30 Days	Total	Overnight and Continuous
Repurchase agreements:				
U.S. Treasury and agency securities	\$88,904	\$—	\$88,904	\$ 43,072
Total	88,904	—	88,904	43,072
Securities lending transactions:				
US Treasury and agency securities	249	—	249	—
Corporate debt securities	278	—	278	35
Equity securities	6,426	137	6,563	11,020
Other ⁽²⁾	8,500	—	8,500	—
Total	15,453	137	15,590	11,055
Gross amount of recognized liabilities for repurchase agreements and securities lending	\$104,357	\$ 137	\$104,494	\$ 54,127

⁽¹⁾ As of December 31, 2017, there were no balances with contractual maturities up to 30 days.

⁽²⁾ Represents a security interest in underlying client assets related to our enhanced custody business, which assets clients have allowed us to transfer and re-pledge.

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Note 12. Commitments and Guarantees

The following table presents the aggregate gross contractual amounts of our off-balance sheet commitments and off-balance sheet guarantees as of the dates indicated.

(In millions)	December 31, 2018	December 31, 2017
Commitments:		
Unfunded credit facilities	\$28,951	\$26,488

Guarantees⁽¹⁾:

Indemnified securities financing	\$342,337	\$381,817
Standby letters of credit	2,985	3,158

⁽¹⁾ The potential losses associated with these guarantees equal the gross contractual amounts and do not consider the value of any collateral or reflect any participations to independent third parties.

Unfunded Credit Facilities

Unfunded credit facilities consist of liquidity facilities for our fund and municipal lending clients and undrawn lines of credit related to senior secured bank loans.

As of December 31, 2018, approximately 73% of our unfunded commitments to extend credit expire within one year. Since many of these commitments are expected to expire or renew without being drawn upon, the gross contractual amounts do not necessarily represent our future cash requirements.

Indemnified Securities Financing

On behalf of our clients, we lend their securities, as agent, to brokers and other institutions. In most circumstances, we indemnify our clients for the fair market value of those securities against a failure of the borrower to return such securities. We require the borrowers to maintain collateral in an amount in excess of 100% of the fair market value of the securities borrowed. Securities on loan and the collateral are revalued daily to determine if additional collateral is necessary or if excess collateral is required to be returned to the borrower. Collateral received in connection with our securities lending services is held by us as agent and is not recorded in our consolidated statement of condition.

The cash collateral held by us as agent is invested on behalf of our clients. In certain cases, the cash collateral is invested in third-party repurchase agreements, for which we indemnify the client against the loss of the principal invested. We require the counterparty to the indemnified repurchase agreement to provide collateral in an amount in excess of 100% of the amount of the repurchase agreement. In our role as agent, the indemnified repurchase agreements and the related collateral held by us are not recorded in our consolidated statement of condition.

The following table summarizes the aggregate fair values of indemnified securities financing and related collateral, as well as collateral invested in indemnified repurchase agreements, as of the dates indicated:

(In millions)	December 31, 2018	December 31, 2017
Fair value of indemnified securities financing	\$342,337	\$381,817
Fair value of cash and securities held by us, as agent, as collateral for indemnified securities financing	357,893	400,828
Fair value of collateral for indemnified securities financing invested in indemnified repurchase agreements	42,610	61,270
Fair value of cash and securities held by us or our agents as collateral for investments in indemnified repurchase agreements	45,064	65,272

In certain cases, we participate in securities finance transactions as a principal. As a principal, we borrow securities from the lending client and then lend such securities to the subsequent borrower, either our client or a broker/dealer. Our right to receive and obligation to return collateral in connection with our securities lending transactions are

recorded in other assets and other liabilities, respectively, in our consolidated statement of condition. As of December 31, 2018 and December 31, 2017, we had approximately \$19.58 billion and \$19.40 billion, respectively, of collateral provided and approximately \$11.52 billion and \$3.85 billion, respectively, of collateral received from clients in connection with our participation in principal securities finance transactions.

Stable Value Protection

Stable value funds wrapped by us are high-quality diversified portfolios of short-intermediate duration fixed-income investments. Stable value contracts are derivative contracts that also qualify as guarantees. The notional amount under non-hedging derivatives, provided in Note 10, generally represents our maximum exposure under these derivatives contracts. However, exposure to various stable value contracts is contractually limited to substantially lower amounts than the notional values, which represent the total assets of the stable value funds.

Standby Letters of Credit

Standby letters of credit provide credit enhancement to our municipal clients to support the issuance of capital markets financing.

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Note 13. Contingencies

Legal and Regulatory Matters

In the ordinary course of business, we and our subsidiaries are involved in disputes, litigation, and governmental or regulatory inquiries and investigations, both pending and threatened. These matters, if resolved adversely against us or settled, may result in monetary awards or payments, fines and penalties or require changes in our business practices. The resolution or settlement of these matters is inherently difficult to predict. Based on our assessment of these pending matters, we do not believe that the amount of any judgment, settlement or other action arising from any pending matter is likely to have a material adverse effect on our consolidated financial condition. However, an adverse outcome or development in certain of the matters described below could have a material adverse effect on our consolidated results of operations for the period in which such matter is resolved, or an accrual is determined to be required, on our consolidated financial condition, or on our reputation.

We evaluate our needs for accruals of loss contingencies related to legal and regulatory proceedings on a case-by-case basis. When we have a liability that we deem probable, and we deem the amount of such liability can be reasonably estimated as of the date of our consolidated financial statements, we accrue our estimate of the amount of loss. We also consider a loss probable and establish an accrual when we make, or intend to make, an offer of settlement. Once established, an accrual is subject to subsequent adjustment as a result of additional information. The resolution of legal and regulatory proceedings and the amount of reasonably estimable loss (or range thereof) are inherently difficult to predict, especially in the early stages of proceedings. Even if a loss is probable, an amount (or range) of loss might not be reasonably estimated until the later stages of the proceeding due to many factors such as the presence of complex or novel legal theories, the discretion of governmental authorities in seeking sanctions or negotiating resolutions in civil and criminal matters, the pace and timing of discovery and other assessments of facts and the procedural posture of the matter (collectively, "factors influencing reasonable estimates").

As of December 31, 2018, our aggregate accruals for loss contingencies for legal and regulatory matters totaled approximately \$38 million. To the extent that we have established accruals in our consolidated statement of condition for probable loss contingencies, such accruals may not be sufficient to cover our ultimate financial exposure associated with any settlements or judgments. Any such ultimate financial exposure, or proceedings to which we may become subject in the future, could have a material adverse effect on our

businesses, on our future consolidated financial statements or on our reputation.

As of December 31, 2018, for those matters for which we have accrued probable loss contingencies (including the Invoicing Matter described below) and for other matters for which loss is reasonably possible (but not probable) in future periods, and for which we are able to estimate a range of reasonably possible loss, our estimate of the aggregate reasonably possible loss (in excess of any accrued amounts) ranges up to approximately \$300 million. Our estimate with respect to the aggregate reasonably possible loss is based upon currently available information and is subject to significant judgment and a variety of assumptions and known and unknown uncertainties, which may change quickly and significantly from time to time, particularly if and as we engage with applicable governmental agencies or plaintiffs in connection with a proceeding. Also, the matters underlying the reasonably possible loss will change from time to time. As a result, actual results may vary significantly from the current estimate.

In certain pending matters, it is not currently feasible to reasonably estimate the amount or a range of reasonably possible loss, and such losses, which may be significant, are not included in the estimate of reasonably possible loss discussed above. This is due to, among other factors, the factors influencing reasonable estimates described above. An adverse outcome in one or more of the matters for which we have not estimated the amount or a range of reasonably possible loss, individually or in the aggregate, could have a material adverse effect on our businesses, on our future consolidated financial statements or on our reputation. Given that our actual losses from any legal or regulatory proceeding for which we have provided an estimate of the reasonably possible loss could significantly exceed such estimate, and given that we cannot estimate reasonably possible loss for all legal and regulatory proceedings as to which we may be subject now or in the future, no conclusion as to our ultimate exposure from current pending or

potential legal or regulatory proceedings should be drawn from the current estimate of reasonably possible loss. The following discussion provides information with respect to significant legal, governmental and regulatory matters.

Invoicing Matter

In 2015, we determined that we had incorrectly invoiced clients for certain expenses. We have reimbursed most of our affected customers for those expenses, and we have implemented enhancements to our billing processes. In connection with our enhancements to our billing processes, we continue to review historical billing practices and may from time to time identify additional remediation. In 2017, we identified an additional area of incorrect expense billing

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associated with mailing services in our retirement services business. The accrual for loss contingencies at December 31, 2018 included an estimate of the amount we anticipate reimbursing clients due to that error. We currently expect the cumulative total of our payments to customers for these invoicing errors, including the error in the retirement services business, to be at least \$380 million, all of which has been paid or is accrued. However, we may identify additional remediation costs.

In March 2017, a purported class action was commenced against us alleging that our invoicing practices violated duties owed to retirement plan customers under ERISA. In addition, we have received a purported class action demand letter alleging that our invoicing practices were unfair and deceptive under Massachusetts law. A class of customers, or particular customers, may assert that we have not paid to them all amounts incorrectly invoiced, and may seek double or treble damages under Massachusetts law.

We are also cooperating with investigations by governmental and regulatory authorities on these matters, including the civil and criminal divisions of the DOJ, the SEC, the DOL and the Massachusetts Attorney General, which could result in significant fines or other sanctions, civil and criminal, against us. If these governmental or regulatory authorities were to conclude that all or a portion of the billing errors merited civil or criminal sanctions, any fine or other penalty could be a significant percentage, or a multiple of, the portion of the overcharging serving as the basis of such a claim or of the full amount overcharged. The governmental and regulatory authorities have significant discretion in civil and criminal matters as to the fines and other penalties they may seek to impose. The severity of such fines or other penalties could take into account factors such as the amount and duration of our incorrect invoicing, the government's or regulator's assessment of the conduct of our employees, as well as prior conduct such as that which resulted in our January 2017 deferred prosecution agreement in connection with transition management services and our settlement of civil claims regarding our indirect foreign exchange business. The staff of the SEC has informed us that it intends to ask the SEC for permission to bring an action against us asserting that we overcharged clients that are registered investment companies for custody expenses in violation of §§ 31(a), 34(b) and 37 of the Investment Company Act of 1940, and Rules 31a-1(a) and 31a-1(b) thereunder. We have submitted to the staff of the SEC a response, which included a settlement proposal, which the staff has indicated is too low, and we remain in discussions with the staff as to a potential settlement. Our aggregate accruals for loss contingencies for legal and regulatory matters as of December 31, 2018 include the amount of penalties reflected in our settlement proposal. There can be no

assurance that any settlement, whether with the SEC or other governmental authorities, will be reached or, if so, the amount of the settlement or its impact on other claims relating to these matters. In the first half of 2019, it is likely that discussions will commence with the DOJ regarding a potential resolution of their investigation regarding this matter, which will then enable us to better assess the potential penalties and/or other sanctions they will be seeking. The aggregate amount of penalties that may potentially be imposed upon us in connection with the resolution of all outstanding investigations into our historical billing practices could be multiples of the potential penalties being discussed with the staff of the SEC.

The outcome of any of these proceedings and, in particular, any criminal sanction could materially adversely affect our results of operations and could have significant collateral consequences for our business and reputation.

Federal Reserve/Massachusetts Division of Banks Written Agreement

On June 1, 2015, we entered into a written agreement with the Federal Reserve and the Massachusetts Division of Banks relating to deficiencies identified in our compliance programs with the requirements of the Bank Secrecy Act, AML regulations and U.S. economic sanctions regulations promulgated by OFAC. As part of this enforcement action, we have been required to, among other things, implement improvements to our compliance programs. If we fail to comply with the terms of the written agreement, we may become subject to fines and other regulatory sanctions, which may have a material adverse effect on us.

Shareholder Litigation

A shareholder of ours has filed a purported class action complaint against the Company alleging that the Company's financial statements in its annual reports for the 2011-2014 period were misleading due to the inclusion of revenues associated with the invoicing matter referenced above and the facts surrounding our 2017 settlements with the U.S. government relating to our transition management business. The Court has preliminarily approved a class settlement in this matter for \$4.9 million. The final fairness hearing is scheduled to take place in April 2019. In addition, a shareholder of ours has filed a derivative complaint against the Company's past and present officers and directors to recover alleged losses incurred by the Company relating to the invoicing matter and to our Ohio public retirement plans matter.

Income Taxes

In determining our provision for income taxes, we make certain judgments and interpretations with respect to tax laws in jurisdictions in which we have business operations. Because of the complex nature of

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these laws, in the normal course of our business, we are subject to challenges from U.S. and non-U.S. income tax authorities regarding the amount of income taxes due. These challenges may result in adjustments to the timing or amount of taxable income or deductions or the allocation of taxable income among tax jurisdictions. We recognize a tax benefit when it is more likely than not that our position will result in a tax deduction or credit. Unrecognized tax benefits of approximately \$108 million as of December 31, 2018 increased from \$94 million as of December 31, 2017.

We are presently under audit by a number of tax authorities, and the Internal Revenue Service is currently reviewing our U.S. income tax returns for the tax years 2014 and 2015. The earliest tax year open to examination in jurisdictions where we have material operations is 2012. Management believes that we have sufficiently accrued liabilities as of December 31, 2018 for potential tax exposures.

Note 14. Variable Interest Entities

We are involved, in the normal course of our business, with various types of special purpose entities, some of which meet the definition of VIEs. When evaluating a VIE for consolidation, we must determine whether or not we have a variable interest in the entity. Variable interests are investments or other interests that absorb portions of an entity's expected losses or receive portions of the entity's expected returns. If it is determined that we do not have a variable interest in the VIE, no further analysis is required and we do not consolidate the VIE. If we hold a variable interest in a VIE, we are required by U.S. GAAP to consolidate that VIE when we have a controlling financial interest in the VIE and therefore are deemed to be the primary beneficiary. We are determined to have a controlling financial interest in a VIE when it has both the power to direct the activities of the VIE that most significantly impact the VIE's economic performance and the obligation to absorb losses or the right to receive benefits of the VIE that could potentially be significant to that VIE. This determination is evaluated periodically as facts and circumstances change.

Asset-Backed Investment Securities

We invest in various forms of ABS, which we carry in our investment securities portfolio. These ABS meet the U.S. GAAP definition of asset securitization entities, which are considered to be VIEs. We are not considered to be the primary beneficiary of these VIEs since we do not have control over their activities. Additional information about our ABS is provided in Note 3.

Tax-Exempt Investment Program

In the normal course of our business, we structure and sell certificated interests in pools of tax-exempt investment grade assets, principally to our mutual fund clients. We structure these pools as partnership trusts, and the assets and liabilities of the trusts are recorded in our consolidated statement of condition as AFS investment securities and other short-term borrowings. As of December 31, 2018 and December 31, 2017, we carried AFS investment securities, composed of securities related to state and political subdivisions, with a fair value of \$1.05 billion and \$1.25 billion, respectively, and other short-term borrowings of \$0.93 billion and \$1.08 billion, respectively, in our consolidated statement of condition in connection with these trusts. The interest income and interest expense generated by the investments and certificated interests, respectively, are recorded as components of NII when earned or incurred. We transfer assets to the trusts from our investment securities portfolio at adjusted book value, and the trusts finance the acquisition of these assets by selling certificated interests issued by the trust to third-party investors and to us as residual holder. These transfers do not meet the de-recognition criteria defined by U.S. GAAP, and therefore, the assets continue to be recorded in our consolidated financial statements. The trusts had a weighted-average life of approximately 3.6 years as of December 31, 2018, compared to approximately 4.6 years as of December 31, 2017. Under separate legal agreements, we provide liquidity facilities to these trusts and, with respect to certain securities, letters of credit. As of December 31, 2018, our commitments to the trusts under these liquidity facilities and/or letters of credit totaled \$946 million, and neither of the liquidity facilities nor letters of credit were utilized. In the event that our obligations under these liquidity facilities are triggered, no material impact to our consolidated results of operations or financial condition is expected to occur, because the securities are already recorded at fair value in our consolidated statement of condition. In addition, neither creditors or third-party investors in the trusts have any

recourse to our general credit other than through the liquidity facilities and letters of credit noted above.

Interests in Investment Funds

In the normal course of business, we manage various types of investment funds through State Street Global Advisors in which our clients are investors, including State Street Global Advisors commingled investment vehicles and other similar investment structures. The majority of our AUM are contained within such funds. The services we provide to these funds generate management fee revenue. From time to time, we may invest cash in the funds in order for the funds to establish a performance history for newly-launched

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strategies, referred to as seed capital, or for other purposes.

With respect to our interests in funds that meet the definition of a VIE, a primary beneficiary assessment is performed to determine if we have a controlling financial interest. As part of our assessment, we consider all the facts and circumstances regarding the terms and characteristics of the variable interest(s), the design and characteristics of the fund and the other involvements of the enterprise with the fund. Upon consolidation of certain funds, we retain the specialized investment company accounting rules followed by the underlying funds.

All of the underlying investments held by such consolidated funds are carried at fair value, with corresponding changes in the investments' fair values reflected in foreign exchange trading services revenue in our consolidated statement of income. When we no longer control these funds due to a reduced ownership interest or other reasons, the funds are de-consolidated and accounted for under another accounting method if we continue to maintain investments in the funds.

As of December 31, 2018, we do not have any consolidated sponsored investment funds. As of December 31, 2017, the aggregate assets and liabilities of our consolidated sponsored investment funds totaled approximately \$150 million and \$50 million, respectively.

Our conclusion to consolidate a fund may vary from period to period, most commonly as a result of fluctuation in our ownership interest as a result of changes in the number of fund shares held by either us or by third parties. Given that the funds follow specialized investment company accounting rules which prescribe fair value, a de-consolidation generally would not result in gains or losses for us.

The net assets of any consolidated fund are solely available to settle the liabilities of the fund and to settle any investors' ownership redemption requests, including any seed capital invested in the fund by us. We are not contractually required to provide financial or any other support to any of our funds. In addition, neither creditors nor equity investors in the funds have any recourse to our general credit.

As of December 31, 2018 and December 31, 2017, we managed certain funds, considered VIEs, in which we held a variable interest but for which we were not deemed to be the primary beneficiary. Our potential maximum loss exposure related to these unconsolidated funds totaled approximately \$70 million and \$72 million as of December 31, 2018 and December 31, 2017, respectively, and represented the carrying value of our investments, which are recorded in either AFS investment securities or other assets in our consolidated statement of condition. The amount of loss we may recognize during any period is limited to the

carrying amount of our investments in the unconsolidated funds.

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Note 15. Shareholders' Equity

Preferred Stock

In September 2018, we issued 500,000 depositary shares, each representing 1/100th ownership interest in a share of our fixed-to-floating rate non-cumulative perpetual preferred stock, Series H, without par value per share, with a liquidation preference of \$100,000 per share (equivalent to \$1,000 per depositary share), in a public offering. The aggregate proceeds, net of underwriting discounts, commissions and other issuance costs, were approximately \$500 million, and were used to fund a portion of our acquisition of Charles River Development on October 1, 2018.

Dividends on the Series H Preferred stock are paid semi-annually and commenced on December 15, 2018, with the first dividend paid on a pro-rata basis.

The following table summarizes selected terms of each of the series of the preferred stock issued and outstanding as of December 31, 2018:

	Issuance Date	Depositary Shares Issued	Ownership Interest Per Depositary Share	Liquidation Preference Per Share	Liquidation Preference Per Depositary Share	Net Proceeds of Offering (In millions)	Redemption Date ⁽¹⁾
Preferred Stock ⁽²⁾ :							
Series C	August 2012	20,000,000	1/4,000th	\$ 100,000	\$ 25	\$ 488	September 15, 2017
Series D	February 2014	30,000,000	1/4,000th	100,000	25	742	March 15, 2024
Series E	November 2014	30,000,000	1/4,000th	100,000	25	728	December 15, 2019
Series F	May 2015	750,000	1/100th	100,000	1,000	742	September 15, 2020
Series G	April 2016	20,000,000	1/4,000th	100,000	25	493	March 15, 2026
Series H	September 2018	500,000	1/100th	100,000	1,000	494	December 15, 2023

⁽¹⁾ On the redemption date, or any dividend declaration date thereafter, the preferred stock and corresponding depositary shares may be redeemed by us, in whole or in part, at the liquidation price per share and liquidation price per depositary share plus any declared and unpaid dividends, without accumulation of any undeclared dividends.

⁽²⁾ The preferred stock and corresponding depositary shares may be redeemed at our option in whole, but not in part, prior to the redemption date upon the occurrence of a regulatory capital treatment event, as defined in the certificate of designation, at a redemption price equal to the liquidation price per share and liquidation price per depositary share plus any declared and unpaid dividends, without accumulation of any undeclared dividends.

The following table presents the dividends declared for each of the series of preferred stock issued and outstanding for the periods indicated:

Years Ended December 31, 2018			2017		
Dividends Declared per Share	Dividends Declared per Depositary Share	Total (In millions)	Dividends Declared per Share	Dividends Declared per Depositary Share	Total (In millions)

Preferred Stock:

Series C	\$5,250	\$ 1.32	\$ 26	\$5,250	\$ 1.32	\$ 26
Series D	5,900	1.48	44	5,900	1.48	44
Series E	6,000	1.52	45	6,000	1.52	45
Series F	5,250	52.50	40	5,250	52.50	40
Series G	5,352	1.32	27	5,352	1.32	27
Series H	1,219	12.18	6	—	—	—
Total			\$ 188			\$ 182

In January 2019, we declared dividends on our Series C, D, E, F and G preferred stock of approximately \$1,313, \$1,475, \$1,500, \$2,625 and \$1,338, respectively, per share, or approximately \$0.33, \$0.37, \$0.38, \$26.25 and \$0.33, respectively, per depositary share. These dividends total approximately \$6 million, \$11 million, \$11 million, \$20 million and \$7 million on our Series C, D, E, F and G preferred stock, respectively, which will be paid in March 2019.

Common Stock

In July 2018, we completed a public offering of approximately 13.24 million shares of our common stock. The offering price was \$86.93 per share and net proceeds totaled approximately \$1.15 billion, which were used to fund a portion of our acquisition of Charles River Development on October 1, 2018.

In June 2017, our Board approved a common stock purchase program authorizing the purchase of up to \$1.4 billion of our common stock through June 30, 2018 (the 2017 Program). In June 2018, our Board approved a common

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stock purchase program authorizing the purchase of up to \$1.2 billion of our common stock through June 30, 2019 (the 2018 Program). We did not repurchase any common stock during either the second quarter of 2018 under the 2017 Program or the third and fourth quarters of 2018 under the 2018 Program. The table below presents the activity under our common stock purchase program during the period indicated:

Year Ended December 31, 2018 ⁽¹⁾		
Shares Acquired (In millions)	Average Cost per Share (In millions)	Total Acquired (In millions)
2017 Program	3.3 \$ 105.31	\$ 350

⁽¹⁾ During the year ended December 31, 2018, there were no shares repurchased under the 2018 Program. The table below presents the dividends declared on common stock for the periods indicated:

Years Ended December 31,			
2018		2017	
Dividends Declared per Share	Total (In millions)	Dividends Declared per Share	Total (In millions)
Common Stock	\$ 1.78 \$ 665	\$ 1.60 \$ 596	
Accumulated Other Comprehensive Income (Loss)			

The following table presents the after-tax components of AOCI as of the dates indicated:

(In millions)	Years Ended December 31,		
	2018	2017	2016
Net unrealized (losses) gains on cash flow hedges	\$(89)	\$(56)	\$229
Net unrealized (losses) gains on available-for-sale securities portfolio	(193)	148	(225)
Net unrealized gains related to reclassified available-for-sale securities	58	19	25
Net unrealized (losses) gains on available-for-sale securities	(135)	167	(200)
Net unrealized (losses) on available-for-sale securities designated in fair value hedges	(40)	(64)	(86)
Net unrealized gains (losses) on hedges of net investments in non-U.S. subsidiaries	16	(65)	95
Other-than-temporary impairment on held-to-maturity securities related to factors other than credit	(2)	(6)	(9)
Net unrealized (losses) on retirement plans	(143)	(170)	(194)
Foreign currency translation	(963)	(815)	(1,875)
Total	\$(1,356)	\$(1,009)	\$(2,040)

The following table presents changes in AOCI by component, net of related taxes, for the periods indicated:

(In millions)	Net Unrealized Gains (Losses) on Cash Flow Hedges	Net Unrealized Gains (Losses) on Available-for-Sale Securities	Net Unrealized Gains (Losses) on Hedges of Net Investments in Non-U.S. Securities	Other-Than-Temporary Impairment on Held-to-Maturity Securities	Net Unrealized Losses on Retirement Plans	Foreign Currency Translation	Total

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			Subsidiaries					
Balance as of December 31, 2016	\$ 229	\$ (286)	\$ 95	\$ (9)	\$ (194)	\$ (1,875)	\$ (2,040)	
Other comprehensive income (loss) before reclassifications	(285)	412	(160)	3	—	1,059	1,029	
Amounts reclassified into (out of) earnings	—	(23)	—	—	24	1	2	
Other comprehensive income (loss)	(285)	389	(160)	3	24	1,060	1,031	
Balance as of December 31, 2017	\$ (56)	\$ 103	\$ (65)	\$ (6)	\$ (170)	\$ (815)	\$ (1,009)	
Other comprehensive income (loss) before reclassifications	(33)	(285)	81	6	—	(148)	(379)	
Amounts reclassified into (out of) earnings	—	7	—	(2)	27	—	32	
Other comprehensive income (loss)	(33)	(278)	81	4	27	(148)	(347)	
Balance as of December 31, 2018	\$ (89)	\$ (175)	\$ 16	\$ (2)	\$ (143)	\$ (963)	\$ (1,356)	

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The following table presents after-tax reclassifications into earnings for the periods indicated:

(In millions)	Years Ended		Affected Line Item in Consolidated Statement of Income
	December 31, 2018	2017	
	Reclassified into (out of) Earnings	Amounts	
Available-for-sale securities:			
Net realized gains (losses) from sales of available-for-sale securities, net of related taxes of (\$2) and \$16, respectively	\$7	\$(23)	Net gains (losses) from sales of available-for-sale securities
Held-to-maturity securities:			
Other-than-temporary impairment on held-to-maturity securities related to factors other than credit, net of related taxes of \$1 and zero, respectively	(2)	—	Losses reclassified (from) to other comprehensive income
Retirement plans:			
Amortization of actuarial losses, net of related taxes of (\$8) and (\$8), respectively	27	24	Compensation and employee benefits expenses
Foreign currency translation:			
Sales of non-U.S. entities, net of related taxes	—	1	Processing fees and other revenue
Total reclassifications into (out of) AOCI	\$32	\$2	

Note 16. Regulatory Capital

We are subject to various regulatory capital requirements administered by federal banking agencies. Failure to meet minimum regulatory capital requirements can initiate certain mandatory and discretionary actions by regulators that, if undertaken, could have a direct material effect on our consolidated financial condition. Under current regulatory capital adequacy guidelines, we must meet specified capital requirements that involve quantitative measures of our consolidated assets, liabilities and off-balance sheet exposures calculated in conformity with regulatory accounting practices. Our capital components and their classifications are subject to qualitative judgments by regulators about components, risk weightings and other factors.

As required by the Dodd-Frank Act, we and State Street Bank, as advanced approaches banking organizations, are subject to a permanent "capital floor" in the calculation and assessment of regulatory capital adequacy by U.S. banking regulators. Beginning on January 1, 2015, we were required to calculate our risk-based capital ratios using both the advanced approaches and the standardized approach. As a result, from January 1, 2015 going forward, our risk-based capital ratios for regulatory assessment purposes are the lower of each ratio calculated under the standardized approach and the advanced approaches.

The methods for the calculation of our and State Street Bank's risk-based capital ratios have changed

as the provisions of the Basel III final rule related to the numerator (capital) and denominator (RWA) were phased in, and as we calculated our RWA using the advanced approaches. These ongoing methodological changes have resulted in differences in our reported capital ratios from one reporting period to the next that are independent of applicable changes to our capital base, our asset composition, our off-balance sheet exposures or our risk profile.

As of December 31, 2018, we and State Street Bank exceeded all regulatory capital adequacy requirements to which we were subject. As of December 31, 2018, State Street Bank was categorized as "well capitalized" under the applicable regulatory capital adequacy framework, and exceeded all "well capitalized" ratio guidelines to which it was subject. Management believes that no conditions or events have occurred since December 31, 2018 that have changed the

capital categorization of State Street Bank.

The following table presents the regulatory capital structure, total RWA, related regulatory capital ratios and the minimum required regulatory capital ratios for us and State Street Bank as of the dates indicated. As a result of changes in the methodologies used to calculate our regulatory capital ratios from period to period as the provisions of the Basel III final rule were phased in, the ratios presented in the table for each period-end are not directly comparable. Refer to the footnotes following the table.

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(In millions)	State Street				State Street Bank			
	Basel III Advanced Approaches December 31, 2018	Basel III Standardized Approach December 31, 2018	Basel III Advanced Approaches December 31, 2017	Basel III Standardized Approach December 31, 2017	Basel III Advanced Approaches December 31, 2018	Basel III Standardized Approach December 31, 2018	Basel III Advanced Approaches December 31, 2017	Basel III Standardized Approach December 31, 2017
Common shareholders' equity:								
Common stock and related surplus	\$10,565	\$10,565	\$10,302	\$10,302	\$12,894	\$12,894	\$11,612	\$11,612
Retained earnings	20,606	20,606	18,856	18,856	14,261	14,261	12,312	12,312
Accumulated other comprehensive income (loss)	(1,332)	(1,332)	(972)	(972)	(1,112)	(1,112)	(809)	(809)
Treasury stock, at cost	(8,715)	(8,715)	(9,029)	(9,029)	—	—	—	—
Total	21,124	21,124	19,157	19,157	26,043	26,043	23,115	23,115
Regulatory capital adjustments:								
Goodwill and other intangible assets, net of associated deferred tax liabilities ⁽¹⁾	(9,350)	(9,350)	(6,877)	(6,877)	(9,073)	(9,073)	(6,579)	(6,579)
Other adjustments ⁽²⁾	(194)	(194)	(76)	(76)	(29)	(29)	(5)	(5)
Common equity tier 1 capital	11,580	11,580	12,204	12,204	16,941	16,941	16,531	16,531
Preferred stock	3,690	3,690	3,196	3,196	—	—	—	—
Trust preferred capital securities subject to phase-out from tier 1 capital	—	—	—	—	—	—	—	—
Other adjustments	—	—	(18)	(18)	—	—	—	—
Tier 1 capital	15,270	15,270	15,382	15,382	16,941	16,941	16,531	16,531
Qualifying subordinated long-term debt	778	778	980	980	776	776	983	983
Trust preferred capital securities phased out of tier 1 capital	—	—	—	—	—	—	—	—
ALLL and other	14	83	4	72	11	83	—	72
Other adjustments	—	—	1	1	—	—	—	—
Total capital RWA:	\$16,062	\$16,131	\$16,367	\$16,435	\$17,728	\$17,800	\$17,514	\$17,586

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Credit risk ⁽³⁾	\$47,738	\$97,303	\$52,000	\$101,349	\$45,565	\$94,776	\$49,489	\$98,433
Operational risk ⁽⁴⁾	46,060	NA	45,822	NA	44,494	NA	45,295	NA
Market risk	1,517	1,517	1,334	1,334	1,517	1,517	1,334	1,334
Total RWA	\$95,315	\$98,820	\$99,156	\$102,683	\$91,576	\$96,293	\$96,118	\$99,767
Adjusted quarterly average assets	\$211,924	\$211,924	\$209,328	\$209,328	\$209,413	\$209,413	\$206,070	\$206,070

	2018	2017									
Capital Ratios:											
Minimum Requirements Including Capital Conservation Buffer and G-SIB Surcharge ⁽⁵⁾											
Common equity tier 1 capital	7.5 %	6.5 %	12.1 %	11.7 %	12.3 %	11.9 %	18.5 %	17.6 %	17.2 %	16.6 %	%
Tier 1 capital	9.0	8.0	16.0	15.5	15.5	15.0	18.5	17.6	17.2	16.6	
Total capital	11.0	10.0	16.9	16.3	16.5	16.0	19.4	18.5	18.2	17.6	

(1) Amounts for us and State Street Bank as of December 31, 2018 consisted of goodwill, net of associated deferred tax liabilities, and 100% of other intangible assets, net of associated deferred tax liabilities. Amounts for us and State Street Bank as of December 31, 2017 consisted of goodwill, net of deferred tax liabilities and 80% of other intangible assets, net of associated deferred tax liabilities. Intangible assets, net of associated deferred tax liabilities is phased in as a deduction from capital, in conformity with the Basel III final rule.

(2) Other adjustments within CET1 primarily include the overfunded portion of the firm's defined benefit pension plan obligation net of associated deferred tax liabilities, disallowed deferred tax assets, and other required credit risk based deductions.

(3) Includes a CVA which reflects the risk of potential fair value adjustments for credit risk reflected in our valuation of over-the-counter derivative contracts. We used a simple CVA approach in conformity with the Basel III advanced approaches.

(4) Under the current advanced approaches rules and regulatory guidance concerning operational risk models, RWA attributable to operational risk can vary substantially from period-to-period, without direct correlation to the effects of a particular loss event on our results of operations and financial condition and impacting dates and periods that may differ from the dates and periods as of and during which the loss event is reflected in our financial statements, with the timing and categorization dependent on the processes for model updates and, if applicable, model revalidation and regulatory review and related supervisory processes. An individual loss event can have a significant effect on the output of our operational RWA under the advanced approaches depending on the severity of the loss event and its categorization among the seven Basel-defined UOMs.

(5) Minimum requirements were phased in with full implementation beginning on January 1, 2019; minimum requirements listed are as of December 31, 2018.

(6) Minimum requirements were phased in with full implementation beginning on January 1, 2019; minimum requirements listed are as of December 31, 2017.

NA Not applicable

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Note 17. Net Interest Income

The following table presents the components of interest income and interest expense, and related NII, for the periods indicated:

(In millions)	Years Ended		
	December 31,		
	2018	2017	2016
Interest income:			
Interest-bearing deposits with banks	\$387	\$180	\$126
Investment securities:			
U.S. Treasury and federal agencies	1,178	854	821
State and political subdivisions	143	226	224
Other investments	560	658	756
Securities purchased under resale agreements	335	264	146
Loans and leases	687	504	378
Other interest-earning assets	372	222	61
Total interest income	3,662	2,908	2,512
Interest expense:			
Interest-bearing deposits	363	163	85
Securities sold under repurchase agreements	13	2	1
Other short-term borrowings	17	10	7
Long-term debt	389	308	260
Other interest-bearing liabilities	209	121	75
Total interest expense	991	604	428
Net interest income	\$2,671	\$2,304	\$2,084

Note 18. Equity-Based Compensation

We record compensation expense for equity-based awards, such as deferred stock and performance awards, based on the closing price of our common stock on the date of grant, adjusted if appropriate, based on the eligibility of the award to receive dividends. The fair value of stock appreciation rights is determined using the Black-Scholes valuation model.

Compensation expense related to equity-based awards with service-only conditions and terms that provide for a graded vesting schedule is recognized on a straight-line basis over the required service period for the entire award. Compensation expense related to equity-based awards with performance conditions and terms that provide for a graded vesting schedule is recognized over the requisite service period for each separately vesting tranche of the award, and is based on the probable outcome of the performance conditions at each reporting date. Compensation expense is adjusted for assumptions with respect to the estimated amount of awards that will be forfeited prior to vesting, and for employees who have met certain retirement eligibility criteria. Compensation expense for common stock awards granted to employees meeting early retirement eligibility criteria is fully expensed on the grant date. Dividend equivalents for certain equity-based awards are paid on stock units on a current basis prior to vesting and distribution.

The 2017 Stock Incentive Plan, or 2017 Plan, was approved by shareholders in May 2017 for issuance of stock and stock based awards. Awards may be made under the 2017 Plan for (i) up to 8.3 million shares of common stock plus (ii) up to an additional 28.5 million shares that were available to be issued under the 2006 Equity Incentive Plan, or 2006 Plan, or may become available for issuance under the 2006 Plan due to expiration, termination, cancellation, forfeiture or repurchase of awards granted under the 2006 Plan. As of December 31, 2018, a total of 18.9 million shares from the 2006 Plan have been added to and may be issued from the 2017 Plan. As of December 31, 2018, a cumulative total of 3.9 million shares had been awarded under the 2017 Plan and 68.9 million shares had been

awarded under the 2006 Plan. As of December 31, 2017, we had cumulative totals of 0.4 million shares awarded under the 2017 Plan and 68.9 million shares awarded under the 2006 Plan. As of December 31, 2016, we had a cumulative total of 65.7 million shares awarded under the 2006 Plan. The 2017 Plan allows for shares withheld in payment of the exercise price of an award or in satisfaction of tax withholding requirements, shares forfeited due to employee termination, shares expired under options awards, or shares not delivered when performance conditions have not been met, to be added back to the pool of shares available for issuance under the 2017 Plan. From inception to December 31, 2018, fewer than 1 million shares had been awarded under the 2017 Plan but not delivered, and have become available for re-issue. As of December 31, 2018, a total of 23.6 million shares were available for future issuance under the 2017 Plan.

The exercise price of stock appreciation rights may not be less than the fair value of such shares on the date of grant. Stock appreciation rights granted under the 1997 Equity Incentive Plan, or 1997 Plan, and the 2006 Plan, collectively the Plans, generally vest over four years and expire no later than ten years from the date of grant. No stock appreciation rights have been granted since 2009.

For deferred stock awards granted under the Plans, no common stock is issued at the time of grant and the award does not possess dividend and voting rights. Generally, these grants vest over one to four years. Performance awards granted are earned over a performance period based on the achievement of defined goals, generally over three years. Payment for performance awards is made in shares of our common stock equal to its fair market value per share, based on the performance of certain financial ratios, after the conclusion of each performance period.

Beginning with 2012, malus-based forfeiture provisions were included in deferred stock awards granted to employees identified as “material risk-takers,” as defined by management. These malus-

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based forfeiture provisions provide for the reduction or cancellation of unvested deferred compensation, such as deferred stock awards and performance based awards, if it is determined that a material risk-taker made risk-based decisions that exposed us to inappropriate risks that resulted in a material unexpected loss at the business-unit, line-of-business or corporate level. In addition, awards granted to certain of our senior executives, as well as awards granted to individuals in certain jurisdictions, may be subject to recoupment after vesting (if applicable) and delivery to the individual in specified circumstances generally relating to fraud or willful misconduct by the individual that results in material harm to us or a material financial restatement.

Compensation expense related to stock appreciation rights, deferred stock awards and performance awards, which we record as a component of compensation and employee benefits expense in our consolidated statement of income, was \$262 million, \$243 million and \$268 million for the years ended December 31, 2018, 2017 and 2016, respectively. Such expense for 2018, 2017 and 2016 excluded \$45 million, \$15 million and \$9 million, respectively, associated with acceleration of expense in connection with targeted staff reductions. This expense was included in the severance-related portion of the associated restructuring or repositioning charges recorded in each respective year. The following table presents information about stock appreciation rights activity during the years indicated. For the year ended December 31, 2018, no stock appreciation rights were exercised. The total intrinsic value of stock appreciation rights exercised during the years ended December 31, 2017 and 2016 was \$5 million and \$1 million, respectively. As of December 31, 2018, there was no unrecognized compensation cost related to stock appreciation rights.

	Shares (In thousands)	Weighted-Average Exercise Price	Weighted-Average Term (In years)	Remaining Contractual	Total Intrinsic Value (In millions)
Stock Appreciation Rights:					
Outstanding as of December 31, 2016	955	\$ 77.52			
Exercised	(595)	81.71			
Forfeited or expired	(360)	70.59			
Outstanding as of December 31, 2017	0	\$ —	0		\$ —

	Shares (In thousands)	Weighted-Average Grant Date Fair Value
Deferred Stock Awards:		
Outstanding as of December 31, 2016	7,814	\$ 60.01
Granted	2,977	76.38
Vested	(3,686)	62.88
Forfeited	(257)	63.56
Outstanding as of December 31, 2017	6,848	65.44
Granted	2,500	101.25
Vested	(3,235)	70.98
Forfeited	(138)	80.6
Outstanding as of December 31, 2018	5,975	\$ 77.07

The total fair value of deferred stock awards vested for the years ended December 31, 2018, 2017 and 2016, based on the weighted average grant date fair value in each respective year, was \$230 million, \$232 million and \$275 million, respectively. As of December 31, 2018, total unrecognized compensation cost related to deferred stock awards, net of

estimated forfeitures, was \$249 million, which is expected to be recognized over a weighted-average period of 2.5 years.

	Shares (In thousands)	Weighted-Average Grant Date Fair Value
Performance Awards:		
Outstanding as of December 31, 2016	1,247	\$ 60.37
Granted	534	76.27
Forfeited	0	—
Paid out	(233)	58.91
Outstanding as of December 31, 2017	1,548	66.09
Granted	1,067	74.68
Forfeited	(1)	101.26
Paid out	(457)	70.58
Outstanding as of December 31, 2018	2,157	\$ 69.36

The total fair value of performance awards vested for the years ended December 31, 2018, 2017 and 2016, based on the weighted average grant date fair value in each respective year, was \$32 million, \$14 million and \$21 million, respectively. As of December 31, 2018, total unrecognized compensation cost related to performance awards, net of estimated forfeitures, was \$62 million, which is expected to be recognized over a weighted-average period of 2.1 years.

We utilize either treasury shares or authorized but unissued shares to satisfy the issuance of common stock under our equity incentive plans. We do not have a specific policy concerning purchases of our common stock to satisfy stock issuances. We have a general policy concerning purchases of our common stock to meet issuances under our employee benefit plans, including other corporate purposes. Various factors determine the amount and timing of our purchases of our common stock, including regulatory reviews and approvals or non-objections, our regulatory capital requirements, the number of shares we expect to issue

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under employee benefit plans, market conditions (including the trading price of our common stock), and legal considerations. These factors can change at any time, and the number of shares of common stock we will purchase or when we will purchase them cannot be assured. Additional information on our common stock purchase program is provided in Note 15.

Note 19. Employee Benefits

Defined Benefit Pension and Other Post-Retirement Benefit Plans

State Street Bank and certain of its U.S. subsidiaries participate in a non-contributory, tax-qualified defined benefit pension plan. The U.S. defined benefit pension plan was frozen as of December 31, 2007 and no new employees were eligible to participate after that date. We have agreed to contribute sufficient amounts as necessary to meet the benefits paid to plan participants and to fund the plan's service cost, plus interest. U.S. employee account balances earn annual interest credits until the employee begins receiving benefits. Non-U.S. employees participate in local defined benefit plans which are funded as required in each local jurisdiction. In addition to the defined benefit pension plans, we have non-qualified unfunded SERPs that provide certain officers with defined pension benefits in excess of allowable qualified plan limits. State Street Bank and certain of its U.S. subsidiaries also participate in a post-retirement plan that provides health care benefits for certain retired employees. The total expense for these tax-qualified and non-qualified plans was \$11 million, \$15 million and \$16 million in 2018, 2017 and 2016, respectively.

We recognize the funded status of our defined benefit pension plans and other post-retirement benefit plans, measured as the difference between the fair value of the plan assets and the projected benefit obligation, in the consolidated statement of position. The assets held by the defined benefit pension plans are largely made up of common, collective funds that are liquid and invest principally in U.S. equities and high-quality fixed-income investments. The majority of these assets fall within Level 2 of the fair value hierarchy. The benefit obligations associated with our primary U.S. and non-U.S. defined benefit plans, non-qualified unfunded supplemental retirement plans and post-retirement plans were \$1.21 billion, \$110 million and \$12 million, respectively, as of December 31, 2018 and \$1.32 billion, \$125 million and \$16 million, respectively, as of December 31, 2017. As the primary defined benefit plans are frozen, the benefit obligation will only vary over time as a result of changes in market interest rates, the life expectancy of the plan participants and payments made from the plans. The primary U.S. and non-U.S. defined benefit pension plans were underfunded by \$1 million and \$9 million as of December 31, 2018 and 2017, respectively. The non-

qualified supplemental retirement plans were underfunded by \$110 million and \$125 million as of December 31, 2018 and 2017, respectively. The other post-retirement benefit plans were underfunded by \$12 million and \$16 million as of December 31, 2018 and 2017, respectively. The underfunded status is included in other liabilities.

Defined Contribution Retirement Plans

We contribute to employer-sponsored U.S. and non-U.S. defined contribution plans. Our contribution to these plans was \$170 million, \$146 million, and \$132 million in 2018, 2017 and 2016, respectively.

Note 20. Occupancy Expense and Information Systems and Communications Expense

Occupancy expense and information systems and communications expense include depreciation of buildings, leasehold improvements, computer hardware and software, equipment, and furniture and fixtures. Total depreciation expense in 2018, 2017 and 2016 was \$599 million, \$526 million and \$472 million, respectively.

We lease 810,000 square feet at One Lincoln Street, our headquarters building located in Boston, Massachusetts, and a related underground parking garage, under 20-year, non-cancelable capital leases expiring in September 2023. A portion of the lease payments is offset by subleases for approximately 219,000 square feet of the building. As of December 31, 2018 and 2017, an aggregate net book value of \$102 million and \$159 million, respectively, related to the above-described capital leases was recorded in premises and equipment, with the related liability recorded in long-term debt, in our consolidated statement of condition.

Capital lease asset amortization is recorded in occupancy expense on a straight-line basis in our consolidated statement of income over the respective lease term. Lease payments are recorded as a reduction of the liability, with a portion recorded as imputed interest expense. In 2018, 2017 and 2016, interest expense related to these capital lease

obligations, reflected in NII, was \$17 million, \$20 million and \$22 million, respectively. As of December 31, 2018 and 2017, accumulated amortization of capital lease assets was \$352 million and \$401 million, respectively. We have entered into non-cancelable operating leases for premises and equipment. Nearly all of these leases include renewal options. Costs related to operating leases for office space are recorded in occupancy expense. Costs related to operating leases for equipment are recorded in information systems and communications expense. Both are recorded on a straight-line basis.

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Total rental expense net of sublease revenue in 2018, 2017 and 2016 amounted to \$185 million, \$229 million and \$194 million, respectively. Total rental expense was reduced by sublease revenue of \$5 million in both 2018 and 2017, and \$4 million in 2016.

The following table presents a summary of future minimum lease payments under non-cancelable capital and operating leases as of December 31, 2018. Aggregate future minimum rental commitments have been reduced by aggregate sublease rental commitments of \$46 million for capital leases and \$16 million for operating leases.

(In millions)	Capital Operating		Total
	Leases	Leases	
2019	\$ 34	\$ 192	\$ 226
2020	31	181	212
2021	31	170	201
2022	31	147	178
2023	24	128	152
Thereafter	—	380	380
Total minimum lease payments	151	\$ 1,198	\$ 1,349
Less amount representing interest payments (31)			
Present value of minimum lease payments	\$ 120		

Note 21. Expenses

The following table presents the components of other expenses for the periods indicated:

(In millions)	Years Ended		
	December 31,		
	2018	2017	2016
Professional services	\$357	\$340	\$379
Sales advertising public relations	115	67	52
Insurance	97	118	93
Regulatory fees and assessments	87	106	82
Bank operations	70	80	62
Litigation	7	(15)	50
Other	443	233	245
Total other expenses	\$1,176	\$929	\$963

Acquisition Costs

We recorded \$31 million of acquisition costs in 2018 related to our acquisition of Charles River Development on October 1, 2018. In 2017, we recorded approximately \$21 million of acquisition costs primarily related to our acquisition of the GEAM business on July 1, 2016. As we integrate Charles River Development into our business, we expect to incur approximately \$200 million, including the \$31 million in 2018, of acquisition costs, including merger and integration costs, through 2021. For further information on our acquisition of Charles River Development, refer to Note 1.

Restructuring and Repositioning Charges

Repositioning Charges

In 2018, we initiated a new expense program to accelerate efforts to become a higher-performing organization and help navigate challenging market and industry conditions. As part of that program, expenses for 2018 included a repositioning charge of \$300 million, including \$259 million of compensation and employee benefits and \$41 million of occupancy costs.

Beacon

In 2018, we released \$7 million of restructuring accruals related to Beacon. In 2017, we recorded restructuring charges of \$245 million primarily related to Beacon.

The following table presents aggregate activity for the periods indicated:

(In millions)	Employee Related Costs	Real Estate Actions	Asset and Other Write-offs	Total
Accrual Balance at December 31, 2015	\$ 9	\$ 11	\$ 3	\$23
Accruals for Business Operations and Information Technology	(2)	—	—	(2)
Accruals for Beacon	94	18	30	142
Payments and other adjustments	(64)	(12)	(31)	(107)
Accrual Balance at December 31, 2016	\$ 37	\$ 17	\$ 2	\$56
Accruals for Beacon	186	32	27	245
Payments and Other Adjustments	(57)	(17)	(26)	(100)
Accrual Balance at December 31, 2017	\$ 166	\$ 32	\$ 3	\$201
Accruals for Beacon	(7)	—	—	(7)
Accruals for Repositioning Charges	259	41	—	300
Payments and Other Adjustments	(115)	(36)	(2)	(153)
Accrual Balance at December 31, 2018	\$ 303	\$ 37	\$ 1	\$341

Note 22. Income Taxes

We use an asset-and-liability approach to account for income taxes. Our objective is to recognize the amount of taxes payable or refundable for the current year through charges or credits to the current tax provision, and to recognize deferred tax assets and liabilities for future tax consequences of temporary differences between amounts reported in our consolidated financial statements and their respective tax bases. The measurement of tax assets and liabilities

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is based on enacted tax laws and applicable tax rates. The effects of a tax position on our consolidated financial statements are recognized when we believe it is more likely than not that the position will be sustained. A valuation allowance is established if it is considered more likely than not that all or a portion of the deferred tax assets will not be realized. Deferred tax assets and liabilities recorded in our consolidated statement of condition are netted within the same tax jurisdiction.

The following table presents the components of income tax expense (benefit) for the periods indicated:

(In millions)	Years Ended		
	December 31,		
	2018	2017	2016
Current:			
Federal	\$27	\$229	\$(14)
State	144	18	30
Non-U.S.	374	380	320
Total current expense	545	627	336
Deferred:			
Federal	(134)	49	(311)
State	(25)	65	38
Non-U.S.	14	(19)	(85)
Total deferred expense (benefit)	(145)	95	(358)
Total income tax expense (benefit)	\$400	\$722	\$(22)

The following table presents a reconciliation of the U.S. statutory income tax rate to our effective tax rate based on income before income tax expense for the periods indicated:

	Years Ended December		
	31,		
	2018	2017	2016
U.S. federal income tax rate	21.0 %	35.0 %	35.0 %
Changes from statutory rate:			
State taxes, net of federal benefit	3.0	1.9	2.0
Tax-exempt income	(2.1)	(4.5)	(6.1)
Business tax credits ⁽¹⁾	(6.9)	(6.8)	(13.6)
Foreign tax differential	(0.6)	(7.4)	(7.7)
Transition tax	—	15.7	—
Deferred tax revaluation	(1.1)	(6.8)	—
Foreign designated earnings	—	(0.7)	(6.8)
Foreign capital transactions	—	—	(4.3)
Litigation expense	0.3	—	1.4
Other, net	(0.3)	(1.5)	(0.9)
Effective tax rate	13.3 %	24.9 %	(1)%

⁽¹⁾ Business tax credits include low-income housing, production and investment tax credits.

On December 22, 2017, the U.S. President signed into law the TCJA (H.R. 1), reducing the corporate income tax rate from 35% to 21% and enacting a one-time transition tax on unremitted earnings of certain foreign subsidiaries. The TCJA also introduced the Global Intangible Low-Taxed Income (GILTI), a new minimum tax to be imposed on foreign subsidiary

earnings and an alternative tax for excess base erosion payments. In applying the guidance in Staff Accounting Bulletin No. 118 (SAB 118), the 2017 income tax expense included an estimated deferred tax benefit of \$197 million

attributable to certain U.S. deferred tax assets and liabilities and a provisional \$454 million liability attributable to the one-time transition tax on total post-1986 earnings and profits (E&P) of foreign subsidiaries previously deferred from U.S. income taxes.

At December 31, 2018, the accounting for income tax effects of the TCJA has been completed. The 2018 income tax expense included an additional deferred tax benefit of approximately \$32 million related to the TCJA provisional estimate recorded in 2017 mainly attributable to the remeasurement of temporary differences. Our completed analysis of cumulative E&P did not result in a change in estimate for the transition tax liability.

Beginning in 2018, the TCJA subjects a U.S. shareholder to current tax on GILTI earned by certain foreign subsidiaries. We have elected to recognize the resulting tax on GILTI as a period expense in the period the tax is incurred. As such, we have included an estimate of this liability in our estimated annual effective tax rate. This adjustment increased our effective tax rate by 0.2% in 2018, which is reflected in the prior reconciliation table under "Other, net".

Undistributed indefinitely reinvested earnings of certain foreign subsidiaries amounted to approximately \$3.8 billion at December 31, 2018. As a result, no provision has been recorded for state and local or foreign withholding income taxes. If a distribution were to occur, we would be subject to state, local and to foreign withholding tax. It is expected that any distribution will be exempt from federal income tax. Although the foreign withholding tax is generally creditable against U.S. federal income tax, certain credit utilization limitations may result in a net cost.

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The following table presents significant components of our gross deferred tax assets and gross deferred tax liabilities as of the dates indicated:

(In millions)	December 31,	
	2018	2017
Deferred tax assets:		
Unrealized losses on investment securities, net	\$146	\$17
Deferred compensation	134	159
Pension plan	55	82
Accrued expenses	156	132
Foreign currency translation	50	18
General business credit	274	231
NOL and other carryforwards	153	101
Other	—	27
Total deferred tax assets	968	767
Valuation allowance for deferred tax assets	(138)	(88)
Deferred tax assets, net of valuation allowance	\$830	\$679
Deferred tax liabilities:		
Leveraged lease financing	\$—	\$184
Fixed and intangible assets	744	755
Non-U.S. earnings	—	6
Investment basis differences	206	158
Other	11	\$—
Total deferred tax liabilities	\$961	\$1,103

The table below summarizes the deferred tax assets and related valuation allowances recognized as of December 31, 2018:

(In millions)	Deferred Tax Asset	Valuation Allowance	Expiration
General business Credits	\$ 274	\$ —	2035-2038
NOLs - Non-U.S.	55	(41)	2019-2028, None
Other Carryforwards	88	(88)	2037-2039 /None
NOLs - State	11	(9)	2019-2036

Management considers the valuation allowance adequate to reduce the total deferred tax assets to an aggregate amount that will more likely than not be realized. Management has determined that a valuation allowance is not required for the remaining deferred tax assets because it is more likely than not that there is sufficient taxable income of the appropriate nature within the carryforward periods to realize these assets.

At December 31, 2018, 2017 and 2016, the gross unrecognized tax benefits, excluding interest, were \$108 million, \$94 million and \$71 million, respectively. Of this, the amounts that would reduce the effective tax rate, if recognized, are \$100 million, \$87 million and \$63 million, respectively. The reduction in the effective tax rate includes the federal benefit for unrecognized state tax benefits.

The following table presents activity related to unrecognized tax benefits as of the dates indicated:

(In millions)	December 31,		
	2018	2017	2016
Beginning balance	\$94	\$71	\$63
Decrease related to agreements with tax authorities	(40)	(14)	(13)
Increase related to tax positions taken during current year	12	26	7

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Increase related to tax positions taken during prior years	44	11	14
Decreases related to a lapse of the applicable statute of limitations	(2)	—	—
Ending balance	\$108	\$94	\$71

It is reasonably possible that of the \$108 million of unrecognized tax benefits as of December 31, 2018, up to \$25 million could decrease within the next 12 months due to the resolution of various audits. Management believes that we have sufficient accrued liabilities as of December 31, 2018 for tax exposures and related interest expense.

Income tax expense included related interest and penalties of approximately \$1 million and \$3 million in 2018 and 2017, respectively. Total accrued interest and penalties were approximately \$8 million, \$8 million and \$5 million as of December 31, 2018, 2017 and 2016, respectively.

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Note 23. Earnings Per Common Share

Basic EPS is calculated pursuant to the two-class method, by dividing net income available to common shareholders by the weighted-average common shares outstanding during the period. Diluted EPS is calculated pursuant to the two-class method, by dividing net income available to common shareholders by the total weighted-average number of common shares outstanding for the period plus the shares representing the dilutive effect of equity-based awards. The effect of equity-based awards is excluded from the calculation of diluted EPS in periods in which their effect would be anti-dilutive.

The two-class method requires the allocation of undistributed net income between common and participating shareholders. Net income available to common shareholders, presented separately in our consolidated statement of income, is the basis for the calculation of both basic and diluted EPS. Participating securities are composed of unvested and fully vested SERP shares and fully vested deferred director stock awards, which are equity-based awards that contain non-forfeitable rights to dividends, and are considered to participate with the common stock in undistributed earnings.

The following table presents the computation of basic and diluted earnings per common share for the periods indicated:

	Years Ended December		
	31, 2018	2017	2016
(Dollars in millions, except per share amounts)			
Net income	\$2,599	\$2,177	\$2,143
Less:			
Preferred stock dividends	(188)	(182)	(173)
Dividends and undistributed earnings allocated to participating securities ⁽¹⁾	(1)	(2)	(2)
Net income available to common shareholders	\$2,410	\$1,993	\$1,968
Average common shares outstanding (In thousands):			
Basic average common shares	371,983	374,793	391,485
Effect of dilutive securities: equity-based awards	4,493	5,420	4,605
Diluted average common shares	376,476	380,213	396,090
Anti-dilutive securities ⁽²⁾	1,011	188	2,143
Earnings per common share:			
Basic	\$6.48	\$5.32	\$5.03
Diluted ⁽³⁾	6.40	5.24	4.97

⁽¹⁾ Represents the portion of net income available to common equity allocated to participating securities, composed of unvested and fully vested SERP shares and fully vested deferred director stock awards, which are equity-based awards that contain non-forfeitable rights to dividends, and are considered to participate with the common stock in undistributed earnings.

⁽²⁾ Represents equity-based awards outstanding but not included in the computation of diluted average common shares, because their effect was anti-dilutive. Additional information about equity-based awards is provided in Note 18.

⁽³⁾ Calculations reflect allocation of earnings to participating securities using the two-class method, as this computation is more dilutive than the treasury stock method.

Note 24. Line of Business Information

Our operations are organized into two lines of business: Investment Servicing and Investment Management, which are defined based on products and services provided. The results of operations for these lines of business are not necessarily comparable with those of other companies, including companies in the financial services industry.

Investment Servicing provides services for U.S. mutual funds, collective investment funds and other investment pools, corporate and public retirement plans, insurance companies, foundations and endowments worldwide. Products include: custody; product and participant level accounting; daily pricing and administration; master trust and master custody; depotbank services (a fund oversight role created by regulation); record-keeping; cash management; foreign exchange, brokerage and other trading services; securities finance; our enhanced custody product, which integrates principal securities lending and custody; deposit and short-term investment facilities; loans and lease financing; investment manager and alternative investment manager operations outsourcing; performance, risk and compliance analytics; and financial data management to support institutional investors. New products and services resulting from our acquisition of Charles River Development on October 1, 2018 include: portfolio modeling and construction; trade order management; investment risk and compliance; and wealth management solutions.

Investment Management, through State Street Global Advisors, provides a broad range of investment management strategies and products for our clients. Our investment management strategies and products span the risk/reward spectrum, including core and enhanced indexing, multi-asset strategies, active quantitative and fundamental active capabilities and alternative investment strategies. Our AUM is currently primarily weighted to indexed strategies. In addition, we provide a breadth of services and solutions, including environmental, social and governance investing, defined benefit and defined contribution and OCIO. State Street Global Advisors is also a provider of ETFs, including the SPDR® ETF brand.

Our investment servicing strategy is to focus on total client relationships and the full integration of our products and services across our client base through cross-selling opportunities. In general, our clients will use a combination of services, depending on their needs, rather than one product or service. For instance, a custody client may purchase securities finance and cash management services from different business units. Products and services that we provide to our clients are parts of an integrated offering to these clients. We price our products and services on the basis

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of overall client relationships and other factors; as a result, revenue may not necessarily reflect the stand-alone market price of these products and services within the business lines in the same way it would for separate business entities. Our servicing and management fee revenue from the Investment Servicing and Investment Management business lines, including foreign exchange trading services and securities finance activities, represents approximately 75% to 80% of our consolidated total revenue. The remaining 20% to 25% is composed of processing fees and other revenue, including Charles River Development, as well as NII, which is largely generated by our investment of client deposits, short-term borrowings and long-term debt in a variety of assets, and net gains (losses) related to investment securities. These other revenue types are generally fully allocated to, or reside in, Investment Servicing and Investment Management.

Revenue and expenses are directly charged or allocated to our lines of business through management information systems. Assets and liabilities are allocated according to policies that support management's strategic and tactical goals. Capital is allocated based on the relative risks and capital requirements inherent in each business line, along with management judgment. Capital allocations may not be representative

of the capital that might be required if these lines of business were separate business entities.

The following is a summary of our line of business results for the periods indicated.

The "Other" column for the year ended December 31, 2018 included net costs of \$398 million composed of the following:

- Net repositioning charges related to organizational changes and management streamlining of \$300 million;

- Business exit costs of \$24 million;

- Legal and related expenses of \$50 million; and

- Net acquisition and restructuring costs of \$24 million.

The "Other" column for the year ended December 31, 2017 included net acquisition and restructuring costs of \$266 million.

The "Other" column for the year ended December 31, 2016 included net costs of \$199 million composed of the following:

- Net acquisition and restructuring costs of \$209 million; and

- Net severance costs associated with staffing realignment of \$10 million.

The following is a summary of our line of business results for the periods indicated. The amounts in the "Other" columns were not allocated to our business lines. Prior reported results reflect reclassifications, for comparative purposes, related to management changes in methodologies associated with allocations of revenue and expenses to lines of business in 2018.

Years Ended December

31,

Investment Investment

Servicing Management⁽¹⁾